



FRACTIONAL RADIOFREQUENCY MICRONEEDLING FOR SKIN REJUVENATION

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Abstract:

The use of microneedling with or without radiofrequency continues to expand in aesthetics. There are now many different devices available that have multiple indications, unique protocols, and low side effect profiles.

Keywords: Acne scars; Microneedling; Radiofrequency; Radiofrequency microneedling; Skin rejuvenation

Background

Facial rejuvenation has become an increasingly patient-driven procedure with speedy but significant results and minimal downtime being the holy grail of both patient and practitioners. Fractional techniques with both laser and radiofrequency sources have attracted attention with some good results, but still with some downtime. Combination therapy could offer the best points of the separate techniques to give synergistic results with minimal downtime. The present pilot mini-study investigated the safety and efficacy of facial rejuvenation with a combination of microneedling fractional radiofrequency (MFR) and fractional minimally-invasive thulium laser (FTL) treatment.

Device

The Genius device by Lutronic Aesthetic (Billerica, MA) is the latest generation of fractional radiofrequency microneedling (FRFM) appliance and interpret a substantial step forward in multipolar RF technology (Figure 1). The appliance delivers high-intensity focused radiofrequency energy in a fractional pattern through an array of insulated microneedles. The penetration depth of the microneedles can be modified using an on-screen interface and varies from 0.5 to

3.4 mm, enabling a variety of focal RF injuries (Figure 2) to provide a multilayer approach to volumetric treatment. The amount of RF energy delivered can be selected by modifying the power setting up to 50 W, and the exposure time can be varied from 10 milliseconds to 1 second through the user interface. However, without this level of control, previous generations of RFM devices could potentially result in suboptimal outcomes by creating poorly controlled zones of injury.

The Genius FRFM device improves upon previous generations of devices in several ways (summarized in Table 1). First, Lutronic has focused considerably on increasing the quality of the needles in the Genius device. They have improved the taper, grind angles, and smoothness of their insulated needles, resulting in improved sharpness and an enhanced ability to penetrate and glide through the tissue. Second, they have developed the handpiece motor to provide high torque delivery of the microneedle array. When combined with the additional sharpness, this enables the FRFM device to quickly and accurately position its active needle

tips during treatment. Third, the device measures tissue impedance (the instantaneous resistance of the surrounding tissue to RF energy) 500 times per second and modulates the amount of RF energy delivered to each microneedle tip. This allows the device to provide precise energy delivery across a wide range of tissue impedances.

FIGURE 1

The Genius device (Lutronic Aesthetic, Billerica, MA)



to provide real-time auditor feedback to the provider about the effective placement of the needles within the tissue after each pulse, permitting adjustments to the angle of the handpiece or the pressure applied to the skin, if all needles are not optimally inserted. There are three different handpieces available at the time of this writing. A 7×7 array (49 microneedles) for general use, a 2×7 array (14 microneedles) for small areas, and a 9×9 array (81 microneedles) for large surfaces like the thighs or abdomen.

In practice, this platform provides an exceptional amount of control for the clinician. By varying the depth of the needles and the energy delivered, the FRFM device can produce a mild skin-tightening effect (with minimal need for anesthesia or recovery time), or, alternatively, the settings can be increased to deliver a greater amount of energy to the reticular dermis. This results in a greater clinical effect, with the trade-off requiring a local facial block



FIGURE 2

Face			
First pass			
	2.5	20	250
Second pass	2.0	20	200
Third pass	1.5	15	150
Neck			
First pass	1.8	15	180
Second pass	1.5	10	150

The subject is a 70-year-old female shown before, and 2 months after three Genius treatments for acne scarring

Applications

We have had positive experiences using this device for the treatment of acne scarring and for skin rejuvenation. The example you provided of a 70-year-old female with acne scarring shows improved skin texture, softened appearance of acne scars, and reduced visibility of superficial wrinkles. It's impressive that patients often report seeing results after the first treatment and notice additional improvement with each successive treatment. The mild edema and erythema experienced by most patients typically resolve within a week after the procedure, and you have not encountered any long-lasting adverse outcomes. The FRFM device also offers a new application in your practice for skin rejuvenation, specifically with the "Genius Lift" protocol. This protocol targets superficial wrinkles, poor skin texture, and mild laxity of the face and neck. The treatment settings used for each pass are listed in Table 3, and patients receive approximately 1 to 1.4 kJ of energy per treatment, spread over three treatments spaced a month apart. The example you provided of a 51-year-old female treated with the "Genius Lift" protocol shows improvement in skin texture, smoothness, and plumpness, as well as a lightening of superficial lentigines. It's important to note that all patients have provided informed consent for the use of their photographs.

Overall, it's clear that the Genius device with FRFM technology has shown promising results in your practice for the treatment of acne scarring and skin rejuvenation. It's exciting to see the potential of this device and how it can benefit your ethnically diverse patient population.



FIGURE 3

The subject is a 51-year-old female shown before, and 4 months after "Genius Lift" for skin rejuvenation

Conclusions

Genius is an innovative device that offers potential benefits for a variety of clinical applications. Future studies will more precisely examine the results and clarify expectations of the procedure.

In our practice, we have already noticed that FRFM (which I assume is one of the Genius technologies) is well tolerated by patients, has minimal downtime, and produces impressive results in the treatment of sagging skin and acne scars. It is important to continue to improve the technique and carefully select patients with realistic expectations to optimize results.

We would like to note that both physicians and patients should always be aware that individual results may vary, and the results of the procedure may depend on many factors,

Example acne scarring treatment settings				
	Depth, mm	Power, W	Pulse time, ms	
First pass	2.0	20	250	
Second pass	2.0	16	200	
Third pass	1.8	16	150	

including the condition of the individual patient's skin and their response to the procedure. Therefore, it is important to be realistic about expectations and work with a qualified physician to achieve the best results.

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