

Approach for Facial Rejuvenation and Wrinkle Reduction Using Combined Bipolar Radiofrequency and Neuromuscular Emission with device WonderFace.

Štefica Švaganović Steffie MD
Zagreb, Croatia

Background: Facial aging is influenced by skin quality and the condition of underlying muscles that contribute to the overall appearance by lifting the heavy facial structures.

Objective: This study aims to evaluate the safety and efficacy of new facial radiofrequency technology combined with neuromuscular stimulation to treat wrinkles through facial tissue remodeling.

Methods: The following data were evaluated:

- **Group 1:** 8 subjects aged 40 ± 2 years (skin types I-IV), receiving a total of 6 sessions (two sessions per week), followed by a maintenance plan of one to two sessions per month.
- **Group 2:** 8 subjects aged 50 ± 2 years (skin types I-IV), receiving a total of 8 sessions (two sessions per week), followed by a maintenance plan of one weekly session for one month and then one to two sessions per month thereafter.

All subjects sought treatment for facial wrinkles and received therapy using the WonderFace device, which employs Bipolar Radiofrequency and Neuromuscular emissions. A maintenance plan of one to two sessions per month was followed for all subjects. The comfort of the therapy and subject satisfaction were evaluated.

For greater accuracy, only the muscle program emitting a stable frequency of 85Hz with 10-second pauses between Neuromuscular and Radiofrequency emissions was used.

Results: Based on subject data, improvement was observed from the first session, becoming more significant in subsequent days. This improvement can be represented as follows:

- **Group 1:** Subjects aged 40 ± 2 years after 6 sessions within one month:
 - 3 subjects: 10% improvement
 - 4 subjects: 20% improvement
 - 1 subject: 50% improvement

- **Group 2:** Subjects aged 50 ± 2 years after 8 sessions within one month:
 - 3 subjects: 10% improvement
 - 4 subjects: 15% improvement
 - 1 subject: 20% improvement

Overall, participants reported firmer skin, a more defined chin, reduced nasolabial folds, fewer perioral wrinkles, and increased cheek volume.

Conclusion: Documented through both subjective and objective evaluation tools, the Bipolar Radiofrequency and Neuromuscular Emissions procedure was effective for treating wrinkles and improving skin texture.

Introduction

In recent years, several non-invasive and minimally invasive procedures have been developed, mainly for skin tightening using ultrasound energy, radiofrequency, or laser. The Bipolar Radiofrequency modality has been widely adopted due to its ability to induce the production of new collagen and elastin fibrils while enhancing existing connective tissue structures and cellular metabolism. However, when addressing facial appearance, countering only the signs of skin aging is part of the solution. The loss of density in underlying muscles plays a crucial role in the overall facial appearance.

The direct relationship between facial muscles and skin appearance is based on the muscle toning effect, which improves the density and quality of facial muscles, making the attached skin firmer and more elastic. Weakening of the cheek muscles (especially the zygomatic muscles) can promote the descent of soft tissue in the midface area, resulting in increased nasolabial fold formation, jowl formation, and loss of jawline contour. Muscle remodeling can help reshape the face with a lifting effect that significantly contributes to the overall facial appearance.

To target both the skin and facial muscles, Bipolar Radiofrequency and Neuromuscular Emission technologies are combined in the new device, uniquely synchronizing both technologies to address overall facial appearance.

The mechanism of Bipolar Radiofrequency treatment is based on oscillating electric currents flowing through the skin tissue, where they are converted into heat. The new Neuromuscular Emission technology generates a strong electric field that depolarizes motor neurons innervating the facial lifting muscles: the frontalis, zygomatic major and minor, and platysma.

Depolarization of these motor neurons results in contractions of these muscles. The selectivity of the technology, which allows stimulation of only the lifting muscles, is ensured by the design of the applicators containing multiple segments, while Neuromuscular Emission energy is generated only in certain segments covering the lifting muscles. Repeated application of Neuromuscular Emissions initiates muscle protein synthesis, leading to muscle tissue densification and overall improvement.

As documented in previous research, neocollagenesis and neoe elastinogenesis are initiated after Bipolar Radiofrequency therapy, and improvements in skin appearance and properties are generally noticeable weeks after treatment. Additionally, the heat delivered by Bipolar Radiofrequency supports the effect of Neuromuscular Emissions by enhancing blood circulation, increasing nutrient supply, and promoting muscle remodeling and the regeneration of existing muscle fibers.

This study aims to evaluate the safety and efficacy of the new device for treating facial wrinkles and rhytides. We hypothesize that this new treatment can facilitate the natural healing process following the thermal effects of RF and the workload of Neuromuscular Emissions, possibly resulting in wrinkle reduction and improved skin tone.

Methods

Study Population: Sixteen subjects were treated for this study. Exclusion criteria were reviewed, including:

- Healthy subjects over 21 years of age.
- Understanding of the potential benefits of the treatment.
- Presence of clearly visible wrinkles in the treatment area.
- Absence of metallic implants, damage, or wounds in the treatment area.
- No contraindications such as pregnancy or lactation.

Treatment Protocol:

All patients received treatments with the new WonderFace device (manufactured by Lexter Microelectronic Engineering Systems S.L.) using Bipolar Radiofrequency and Neuromuscular Emissions technology for non-invasive wrinkle reduction, rhytides, and overall facial contour improvement.

The treatment was performed on the forehead, submaxillary region, and both cheeks simultaneously using multi-use adhesive applicators. Before each therapy, the treatment area was cleaned of any cosmetics, lotions, jewelry, and prominent hair.

- **Group 1 (aged 40 ± 2 years):** The treatment administration phase consisted of six 25-minute treatment visits, 3-5 days apart. During each session, Bipolar Radiofrequency and Neuromuscular Emission intensities (on a scale of 0 to 50) were set at 70-85%, depending on patient sensitivity, and Neurostimulation was adjusted based on patient feedback on any possible discomfort.
- **Group 2 (aged 50 ± 2 years):** The treatment administration phase consisted of eight 25-minute treatment visits, 2-4 days apart. During each session, Bipolar Radiofrequency and Neuromuscular Emission intensities (on a scale of 0 to 50) were set at 65-80%, depending on patient sensitivity, and Neurostimulation was adjusted based on patient feedback on any possible discomfort.

All patients were required to complete the treatments and subsequent maintenance visits. Patients were monitored for any adverse events during the study duration.

The Subject Satisfaction Questionnaire (SSQ) demonstrated patient satisfaction with the therapy results. The Therapy Comfort Questionnaire indicated no significant pain or discomfort during the treatment.

Results: All patients received treatment for wrinkles with parameters configured according to patient feedback.

Better results were obtained in Group 1 (around 40 years old) and less in Group 2 (around 50 years old).

During treatment, intensities ranged from 10-30% for Neuromuscular Emissions and 65-85% for Bipolar Radiofrequency.

Skin quality, determined by wrinkle uniformity and texture analysis, improved from the first session and was maintained over time with at least one to two monthly maintenance sessions.

The combined use of Bipolar Radiofrequency and Neuromuscular Emissions for overall facial appearance improvement was supported by our findings, with high patient satisfaction and a lifting effect reported by 100% of treated subjects.

This study demonstrates notable improvement in the following aspects:

- Increased skin firmness, with skin becoming tighter and more elastic, returning to its original position even after being stretched and pulled.
- Greater jawline definition due to submaxillary fat loss.
- Decreased depth and prominence of the nasolabial fold.
- Increased cheek volume and elevated cheekbones.

Current facial rejuvenation therapies often include invasive facelift procedures, botulinum toxin injections, and dermal fillers. Despite being effective, these are still considered invasive and may be associated with several side effects and disadvantages such as prolonged recovery or scarring and limited effectiveness on underlying muscles.

The use of a new device offers a way to overcome most of these disadvantages.

The device combines the synchronized effect of Bipolar Radiofrequency on skin tissue with selective stimulation of the underlying fibromuscular tissue and fascia using Neuromuscular Emission technology. This combination presents an interesting opportunity to address facial wrinkles. Additionally, as documented here, the combined treatment is entirely non-invasive and highly comfortable, with minimal or mild discomfort.

Based on our experience, the WonderFace device can be recommended for non-invasive treatment of wrinkles and overall facial skin appearance. WonderFace offers a pleasant and quick non-invasive alternative to current facial therapies or surgeries.

Conclusion: Treatment with the new WonderFace device delivering simultaneous RF and Neuromuscular Emissions resulted in significant improvement in overall facial appearance.

Based on the results, the procedure leads to an average 20% reduction in the severity of facial wrinkles in individuals around 40 years old and a 13.75% reduction among individuals around 50 years old. The treatment demonstrated its safety, as no adverse events were documented.

Author Disclosure Statement:

The study was not sponsored by Lexter Microelectronic. The author has not received any financial compensation for conducting the study.