Microneedle RF Device Combines Technologies for Efficiency and Efficacy

By Lisette Hilton, Contributing Editor

A new state-of-the-art microneedle radiofrequency (MNRF) device represents an important advance in treating a wide range of dermatologic concerns. By integrating multiple technologies, it can be used for enlarged pores, acne and acne scars, pigmentary disorders, skin laxity and even transdermal delivery of topical agents.

Classys has unveiled the multitasking QUADESSY® system, which integrates three core technologies: hybrid thermal coagulation, energy cruise control and its proprietary QuadFusion™ drug delivery system.

According to dermatologist Sangyub Kim, MD, medical director of JF Dermatology & Anti-Aging Aesthetic Surgery Clinic, in Seoul, South Korea, this single device offers aesthetic practices triple the impact.

"QUADESSY is an advanced device that delivers energy to three different dermal layers in a single shot, thereby replicating the clinical effects of multiple treatment passes within a single session," reported Dr. Kim.

Optimizing Tissue Response

At the heart of the QUADESSY device is the Deeplus handpiece, available in both single and multi-tip formats. The multi-tip version features a combination of bipolar electrodes and microneedles arranged to allow sequential energy delivery.

Four bipolar electrodes, located at the periphery of the tip, perform a preheating function, raising the temperature of the epidermis and superficial dermis to between 45-55°C. This preheating stage offers several benefits: it increases local blood perfusion near the basement membrane, promotes cellular metabolism and enhances the integrity of the dermal-epidermal junction. Clinically, it also reduces the resistance of the skin, making subsequent needle insertion smoother and less traumatic.[1]

Perifollicular Remodeling for Pore Tightening

The device's microneedles penetrate the dermis and deliver fractional bipolar RF energy in the range of 60-80°C. This generates controlled thermal coagulation zones at precise depths, stimulating neocollagenesis and neoelastogenesis.

This mechanism has proven to be highly effective for pore tightening, shared Dr. Kim.

When delivered through microneedles with precision depth control, the fractional RF energy targets the perifollicular dermis where dilated pores are commonly supported by weakened collagen structures. The preheating phase enhances dermal perfusion and elasticity, while the subsequent coagulative RF phase initiates collagen remodeling around each follicular unit.

According to Dr. Kim, the result is immediate skin tightening, along with progressive improvement in skin texture and firmness over time.

Unlike traditional RF microneedling systems that rely solely on mechanical penetration followed by energy release, QUADESSY's multiple-phase heating process enables more targeted tissue interaction and a better safety profile.[2]

Transdermal Delivery

The QuadFusion transdermal delivery mechanism enhances the absorption of therapeutic agents through four distinct



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steps. First, microneedle insertion creates vertical channels in the skin. Second, RF-induced coagulation fixes and stabilizes these channels. Third, as the needle retracts, negative pressure facilitates negative pressure-assisted influx, drawing topically applied agents into the microchannels. Finally, by reapplying the needles with positive pressure, the system facilitates deeper intradermal transport of the agents, improving both homogeneity and bioavailability.

"This mechanism is particularly useful for delivering rejuvenating agents, such as polynucleotides or collagen stimulators, into precise dermal layers, making it effective for conditions like atrophic acne scars and other aging-related skin concerns," shared Dr. Kim.[3,4]

QUADESSY is also equipped with an energy cruise control system, an intelligent feedback algorithm that monitors the impedance of the treated areas of the skin in real time and adjusts RF output accordingly.[5]

Efficiency and Efficacy

The device's design allows for triple-depth targeting within a single treatment pass, with a layered approach that replicates multiple treatment passes in a single session, saving time for both the clinician and the patient while increasing clinical efficacy.

From a practical standpoint, QUADESSY is ergonomically optimized to reduce clinician fatigue. The preheating mechanism thermally conditions the tissue, reducing its mechanical resistance to microneedle insertion. This allows microneedles to penetrate with minimal force.

"Furthermore, the uniformity of RF distribution — thanks to the energy cruise control system — minimizes the need for repeated passes and operator-dependent variability, resulting in more reproducible outcomes," added Dr. Kim.

Enhanced Comfort and Safety

With the multi-technology QUADESSY system, patients are likely to experience minimal downtime and a lower incidence of erythema, edema and post-treatment discomfort compared to conventional MNRF systems. Minimized thermal spread and sub-pulsed RF delivery also reduces the likelihood of adverse events, making QUADESSY suitable even for sensitive skin and darker skin tones.

Ongoing research and clinical evaluations are expected to expand its applications, potentially including combination protocols with other energy-based or injectable therapies.

"With QUADESSY, CLASSYS offers a next-generation solution that aligns with the needs of today's clinicians and patients — delivering powerful results with precision, safety and versatility," concluded Dr. Kim.

References:

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Before and one month after two treatments with the QUADESSY multi-tip insulated pin Deeplus handpiece

Photos courtesy of Classys, Inc.