ABSTRACT

Methods to improve the safety and efficacy of monopolar radiofrequency for skin rejuvenation

Shiou-Han Wang, MD
1. Department of Dermatology, National Taiwan University Hospital
2. Skin168 Institute of Dermatology

Introduction:
Monopolar radiofrequency (MRF) is a crucial modality for aesthetic applications that generates heat in soft tissue through electric current, leading to collagen contraction and neocollagenesis. However, treatment outcomes can vary depending on the operator. Analyzing fundamental physics and anatomy can develop comprehensive techniques for MRF treatment.

Material and Methods:
High-frequency ultrasound evaluates skin thickness and provides information on thermal relaxation time for safety. A cooling system adjusts MRF depth by changing impedance and safeguards the skin. Reading manufacturer patents can inspire better firing techniques, such as stamping with superpass or sliding method. SMAS and retaining ligaments play crucial roles in facial aging. According to patient feedback, multiple-pass vectors accumulate heat with the "highest" tolerable energy. The tissue-temperature curve of collagen determines heating time. Heat transfer and thermodynamics models apply to MRF treatment. Fibrous septae are the primary electric current channels affecting MRF's effect on fatty tissue.

Results:
Specific techniques enhance MRF's safety and efficacy for aesthetic applications. High-frequency ultrasound, a cooling system, and relevant firing techniques are essential for safety and efficacy. The response to accumulated energy follows an exponential-like curve. Multiple-pass vectors and the tissue-temperature curve of collagen determine heating time of the ROI (region of interest).

Conclusion:
MRF therapy is crucial for aesthetic applications. Comprehensive techniques enhance MRF's safety and efficacy. This talk will review related studies and update the concept of MRF therapy.