

A High Power Bi-Polar RF Technology for Body Contouring with Sub-Surface Tissue Temperature Control

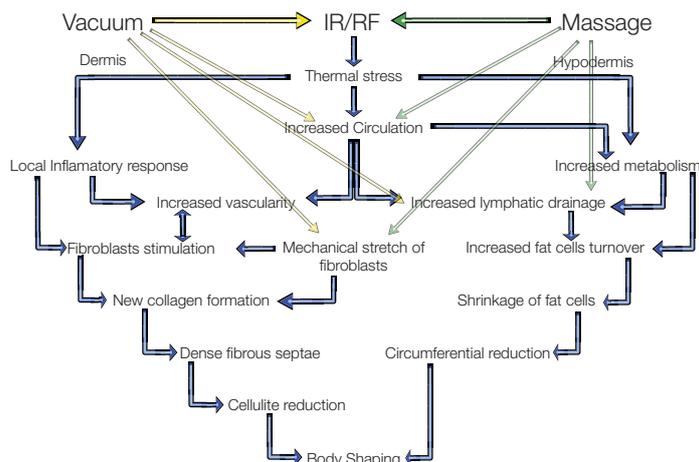
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Mechanism of Action

This technology mechanism of action is based on a novel combination of bi-polar RF and optical energies delivered to the dermis/hypodermis zones. Energy deposition in the targets is further facilitated via the concurrent application of vacuum. Optical energy targets mainly the dermis while the RF energy targets mainly the hypodermis by controlled thermal stress. Applying thermal energy to the dermis causes immediate collagen contraction but also activates a cascade of physiological responses inside the dermal fibroblasts (the cells that produce collagen) to stimulate and promote neocollagenesis (new collagen formation). Neocollagenesis is further potentiated by increased dermal vascularity secondary to the thermal stress induced. The vacuum potentiates neocollagenesis via the mechanical stress imposed on dermal fibroblasts. Neocollagenesis and collagen contraction further contribute to enrichment and strengthening of the otherwise loose connective tissue.

Figure 1.

Biological model for mechanism of action of combined bi-polar RF, IR and mechanical manipulation treatment for body shaping.



Photos Courtesy of Ruthie Amir, MD

Design

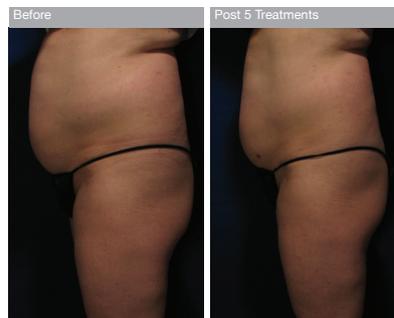
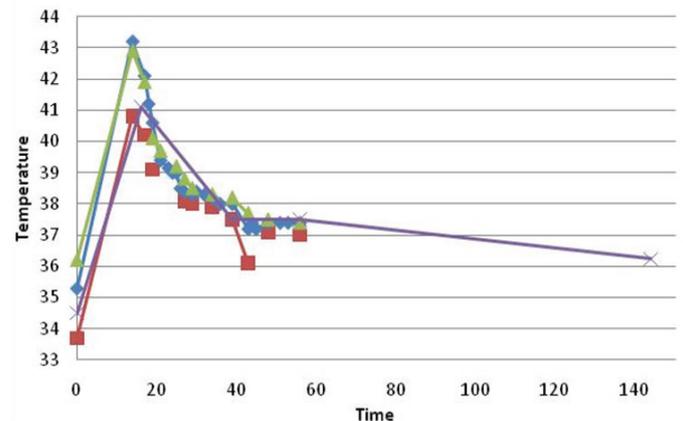
Patients received treatments in their abdomen/flanks areas and were taken during and up to several hours post treatment. Thermocouple needles positioned at 3 hypodermal layers were used for temperature measurements at various energy levels. Data related to the different energy levels were compared. Temperature profiles were correlated with patients' sensations.

Results

A maximum difference of 7.5°C was noted at all layers being treated immediately post treatment. One hour post treatment, in vivo temperature measurements were still increased by 3.5°C and were maintained at this level for at least an additional 1 hour. Patients self-perceived warm sensations in their treatment area up to several hours post treatment. Interestingly, different energy levels yielded similar temperature profiles.

Figure 2.

In Vivo temperature measurements at depth of 5mm (red), 10mm (blue) and 15mm (green) beneath the skin surface following 20 min treatment with combined bi-polar RF, IR and mechanical manipulation technology.



Photos Courtesy of Ruthie Amir, MD

Conclusions

The combined modalities of bi-polar RF and IR energies directed to the dermis/hypodermis via tissue manipulation have been long considered to be an efficient non invasive modality for body contouring. Our data suggests that patients' own physiological responses were triggered by the technology, further supporting the concept that the underlying mechanism of action for volume reduction is confined thermal targeting of the hypodermal adipose. Besides expanding our understanding of the technology, this data provides an objective assessment of treatment efficiency (Figure 3).

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