

# **RF hand pieces for Face Skin Tightening and Body Contouring**

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## **INTRODUCTION**

Radiofrequency dermal heating devices have recently emerged as an effective, non-invasive, aesthetic treatment modality to improve the appearance of cellulite, to eliminate face wrinkles and rhytids, to tighten lax skin and reduce abdominal and thighs circumference. Radiofrequency devices heat under the skin by passing rapidly oscillating electrical currents through the tissues. In monopolar devices current is passed between a small electrode in contact with the treatment area and a large return electrode pad, usually placed under the buttocks, while with bipolar devices the current is passed between two electrodes in contact with the treatment area. Bipolar devices offer better control over the treated tissue volume and require lower powers to heat up a specific volume of under skin. With bipolar devices skin heating depth is a function of the distance between the electrodes, the RF power and the dwell time over the same tissue area. By proper adjustment of these parameters both the dermis and subcutaneous layers can be heated to therapeutic levels while preserving the epidermis. Treatments can be performed with absolutely no downtime and can often result in dramatic changes in body contours as well as face skin texture. Face, neck, arms, abdomen, buttocks and thighs are all amenable to RF treatments.

Radiofrequency aesthetic face skin tightening treatments have been documented to be extremely safe with only minimal and transient side effects such as erythema and slight edema. To maintain this level of safety it was found that anesthesia should be avoided to allow patient feedback regarding pain and heat sensation, which is totally bearable and even pleasant.

Heat produced by RF in the dermis and subcutaneous layer causes immediate tightening of collagen and induces new collagen production. Increase in local blood circulation, promotes fibrous tissue breakdown, drainage of fatty deposits through the lymphatic system and disintegration of fat/cellulite cells. Adipose tissues “mobilize” or release stored fat to make it available as energy for metabolic activities by a physiological mechanism called lipolysis. Like any chemical reaction all enzyme-mediated biological reaction rates, including those of lipolysis, are temperature sensitive. Increasing the temperature of the fat cells by 10°C increases the lipolytic process rate by factor of 2. Increasing the fat cells temperature, above 43°C, results in protein denaturation and irreversible damage. All these mechanisms contribute to the skin tightening effects, skin texture improvements, and reduction in the appearance of cellulite and circumference reduction, all of which have been demonstrated in clinical studies with various RF devices. In these studies facial areas usually required 4-8 weekly sessions while body areas require a course of 8-12 weekly sessions.

Patients usually feel the skin tightening effect immediately following each treatment however the full result becomes evident following the end of the treatment sessions due to the build up of new collagen in the area. Results are expected to last 1-2 years and maintenance treatments can be continued on a regular basis or repeated as desired by the patient.

Finally, RF aesthetic treatments can be combined with a variety of body contouring and skin texture complimentary techniques ranging from cosmetology external products, tissue massage techniques such as LPG, different dietary and physical training programs and other phototherapy technologies as Infrared and Lasers and even as a maintenance tool after plastic surgery.

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#### **MATERIALS AND METHODS**

A new bipolar RF hand pieces for the Formax Plus and Omnimax Aesthetic Stations has been tested on twenty (20) volunteers, 14 females, 6 males, ages between 25 and 45, with face lax skin and various degrees of fat/cellulite in the abdomen and thighs and stretch marks in the buttocks. The twenty (20) volunteers received eight (8) treatments, once a week. This handpiece emits continuous RF powers of up to 50 Watts. Time of the treatment sessions vary depending on the area treated: face and neck around 20 minutes and body areas like abdomen and both legs from 40 to 60

minutes. A non-contact infrared thermometer was used to monitor external skin therapeutic temperature during sessions in order to mantein a constant over 40°C during all the treatment session. Standardized photographs were taken at baseline, before each weekly treatment and at the 1 month follow-up visit. Patient satisfaction scores were also recorded at each visit. Finally circumference measurements were taken on abdomen and thighs at baseline and at the final follow-up visit. Each session's data was file for posterior comparative objective evidence.



**Redness and heat sensation lasting for about 30 minutes after the session**

Treatment contraindications include:

Patients with any active "metal" implants, such as a cardiac pacemaker, treatment over permanent implants, current or history of cancer, diabetes, congestive heart disease, epilepsy, neurological disorders or active infections, significant skin irregularities in treatment area, including dry skin, open wounds, major scars, microvascular disorders, or any inflammatory skin conditions, any recent intervention in the target area which requires a waiting period, use of oral isotretinoin within two

months, or use of topical isotretinoin within one month of treatment, immunosuppressive diseases, including AIDS and HIV infection, or use of immunosuppressive medications, history of bleeding coagulopathies or use of anticoagulants, history of keloid scarring, skin atrophies, or poor wound healing, adverse reaction to the RF conductive lotion, pregnancy and/ or nursing

The circular, bi-polar hand piece used in this study operates at a frequency of 1 MHz and a diameter of 7.5 cm.



**FACE hand piece**

**BODY hand piece**

## RESULTS

At 1 month after the last treatment, 90% of the subjects exhibited moderate to significant improvement in skin laxity and skin texture on the face, neck, arms, abdomen, buttocks and thighs. A significant reduction in abdominal and thigh circumference was found following RF treatment.

Areas with cellulite showed marked improvement. Patients reported high

overall satisfaction with the treatment. No serious complications were recorded.

- Average abdominal circumference reduction in 8 treatments was 4 to 5 cm
- Average thigh (back legs) reduction in 8 treatments was 3 to 4 cm
- Face and neck had a positive subjective evaluation after 8 treatments

**Patient satisfaction scores:**

- Very satisfied 80 %

- Satisfied 15 %

- Not satisfied: 5 %

**CONCLUSION**

The new bipolar RF hand pieces for Sharplight's Aesthetic Stations has been demonstrated to be highly effective and safe for non-invasive skin tightening and body shaping. Quantitative and qualitative results were documented in the treatment of face and neck skin laxity and of cellulite and circumference reduction of abdomen, thighs and buttocks. Very high patient satisfaction was achieved. The procedure is easy to apply, involves no discomfort to the patient and requires no downtime whatsoever.

Clearly visible results were obtained after eight weekly sessions only, with improvement continuing after treatments are terminated. Further treatment sessions or periodic maintenance sessions may be administered as required or desired by each individual patient.

The availability of this new RF hand pieces significantly enhances the capabilities of the SLT Aesthetic Stations, broadening its clinical indications to include skin tightening on all body areas.

**B/A PHOTO**

**Before**



**After 4 sessions**



**Skin tightening and neocollagenesis**

**Before**

**After 8 sessions**



**Lost of 6 cms circumference reduction**

**Before**

**After 8 sessions**



**Lost of 4 cms circumference reduction**

**Fat reduction, cellulite reduction,**

**Stretch marks reduction**

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