91 Facial Radiofrequency Skin Tightening and Fractional Radiofrequency Technology

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Abstract
A treatment gap exists among patients who are not candidates for or prefer to not undergo traditional facelift and/or necklift. In these cases, radiofrequency skin tightening has been shown to achieve approximately 30% skin contraction through thermal injury to the dermis and tightening of underlaying fibroseptal networks. Subsequent collagen remodeling angiogenesis as well as elastin reorganization functions to visibly improve soft tissue laxity in these cases.

Keywords: Radiofrequency skin tightening, radiofrequency, FaceTite, bipolar radiofrequency

Key Points

- Radiofrequency (RF) technology has steadily gained popularity since the early 2000s with consecutive increases annually of 10% or more.
- Through impedance of electromagnetic current, RF waves lead to differential heating across distinct tissue types consistent with Ohm's law (energy = current^0 × impedance × time). For example, adipose tissue is less conductive than water (higher impedance), and leads to generation of higher temperatures than muscle. Once soft tissue temperatures reach 50 °C and skin surface reaches 40 to 42 °C there is a trigger to induce neocollagenesis, angiogenesis, and elastogenesis. Through different applications of RF energy (i.e., monopolar, bipolar, multipolar, microneedling), subdermal adipose remodeling (SAR) and long-term soft tissue contraction can be safely and consistently achieved.

91.1 Preoperative Steps

- A detailed medical history and physical is obtained on all patients prior to treatment. Exclusion criteria include: pregnancy, open wounds, active infection, dermatologic conditions, bleeding disorders, immunocompromised state.
- Patients are marked by first identifying the mandibular border and jowls bilaterally. The jowls are subdivided into Zone 1 (above mandibular border) and Zone 2 (below mandibular border). Areas of localized adiposity in the lower face and neck region are marked. Nontreatment zones are identified by carrying a line inferiorly perpendicular to the lip commissures (i.e., marionette lines) (▶ Fig. 91.1). The area medial to these lines are avoided to preserve marginal mandibular innervation to the depressor anguli oris, mentalis, and depressor labii inferioris. Five access points are identified: (1) the submental midline, (2) 1 to 2 cm inferior to the mandibular parasymphyseal/body junction, and (3) post auricular (▶ Fig. 91.2).
- Depending on clinical circumstances and patient desires, cases were performed either under general or local anesthesia. In cases of local anesthesia, patients were premedicated with oxycodone (5 mg) and/or benzodiazepine (5 mg).

91.2 Operative Steps

- Access sites are each injected with 2 to 4 cc of 2% lidocaine with epinephrine. A 14-gauge needle is then used to make access ports that are slightly dilated with Stevens scissors. A spinal needle is used to slowly infiltrate tumescent solution (1 g lidocaine per liter of lactated Ringer's solution) from deep

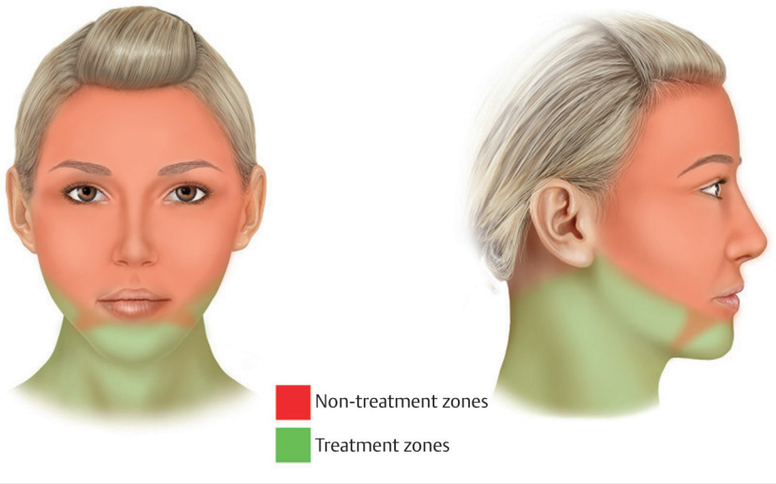

Fig. 91.1 Treatment and nontreatment radiofrequency zones. (Reproduced with permission from Rohrich R, Stuzin J, Dayan E, et al. Facial Danger Zones: Staying Safe with Surgery, Fillers and Non-invasive Devices. 1st ed. Thieme; 2019.)

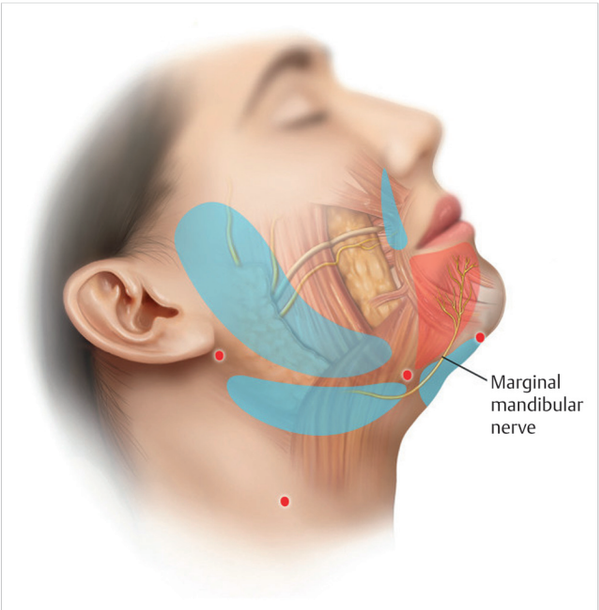

Fig. 91.2 Access ports placement to avoid marginal mandibular and mental nerve injury. (Reproduced with permission from Rohrich R, Stuzin J, Dayan E, et al. Facial Danger Zones: Staying Safe with Surgery, Fillers and Non-invasive Devices. 1st ed. Thieme; 2019.)

Fig. 91.3 Images showing before and 2 weeks after radiofrequency-assisted liposuction of lower face and neck using FaceTite (InMode; Lake Forest, CA).

to superficial, starting in the preplatysmal plane and moving to the subdermal plane (approximately 100–150 cc of tumescent in total). At the conclusion of tumescent infiltration, the cannula is passed through the subdermal plane to confirm adequate analgesia.

- Bipolar RF is performed first. The RF settings included an internal temperature cutoff of 68 °C and external temperature cutoff of 38 °C. The RF cannula is used to pretunnel treatment areas for ease of treatment. The predetermined treatment areas are systematically heated to avoid heat loss when treating wide areas. RF application is applied on retrograde movement of the cannula and stopped within 1 cm of the access port to prevent overheating this area. Audible and visual cues from the RF console are used to assess temperature of tissues and treatment is stopped after 1 minute of reaching target internal and external temperatures.
- RF microneedling (Fractora modified to Morpheus8, InMode) is subsequently used at a depth of 2 mm and energy of 35 with 50% overlap. The hand-piece is applied firmly and perpendicular to the treatment area prior to delivery of RF energy pulses. In patients with thinner skin or darker Fitzpatrick types, energy settings are reduced by 20%.
- Fractional RF is performed at the same stage with the Morpheus8 device (InMode). This device achieves subdermal adipose tissue remodeling in addition to bipolar thermal injury leading to reorganization of the reticular dermis.

91.3 Postoperative Care

- Patients are seen at 1 week, 1 month, 3 months, and 6 months intervals.
- Patient are instructed to not use any skin products for the first 3 to 4 days after fractional RF treatment.
- The usual postoperative course involves some edema and ecchymosis. This typically resolves in 1 week.
- A facelift type head wrap with moderate compression is applied for 3 to 4 days.
- Patients are instructed to not use cold compresses.
- Most patients return to work the following day.

91.4 Case Example

This patient is seen before and 2 weeks after RF-assisted liposuction of the lower face and neck using FaceTite (InMode; Lake Forest, CA) (▶ Fig. 91.3).

91.5 Conclusion

Internal and external generation of heat via combined bipolar RF and fractional RF serves to initiate neocollagenesis, elastogenesis, and subdermal adipose remodeling. This in combination with fibroseptal network tightening allows for safe and consistent soft tissue contraction to improve lower

face and neck soft tissue laxity. This particularly benefits patients who previously may have fallen into a treatment gap.

See **Video 91.1, Video 91.2**, and **Video 91.3**.

Further Readings

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