Hands-on Session: Skin Tightening

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DISCLOSURE OF RELEVANT RELATIONSHIPS WITH INDUSTRY

DISCLOSURES

Allergan: Advisory Board
Cutera: Consultant
Non Invasive Skin Tightening

- Therapies Skin spare the epidermis and melanocytes
- Immediate collagen contraction and collagen denaturation
- Neocollagenesis and remodeling of collagen in 4-6 months

Multiple Energy and Light Based Devices Available

- Thermal energy
- Electrical source such as radiofrequency
- Light based
- Ultrasound (focused and non-focused)
## Laser, Light, & Energy Devices

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Radiofrequency - Basics

- Utilizes an electrical source
- Electrical energy becomes heat energy to the dermis at a relative low temperature
- Induces thermal damage to dermal collagen – leads to remodeling

Radiofrequency

- Impedance dictates where majority of the current will flow
- Lower impedance = conductivity
- Impedance feedback systems are help regulate the degree of energy and heat transferred
Monopolar radiofrequency

- Volumetric bulk heating of the epidermis and dermis
  - Heating is generated by innate tissue resistance to flow of electrical current
  - Depends on the electrical properties of the target tissue
  - Most devices have cooling to protect the epidermis

- Heat → damage → subsequent inflammation alters collagen (remodeling) → produces tightening effect

- Immediate reaction
  - Collagen fibrils incur denaturation which shortens the fibril length
  - Inflammation for the initial heat
Radiofrequency technology

- **Monopolar**
  - Examples: Solta Thermage CPT®; Ellman Pelleve; BTL Exilis
  - Energy is delivered to the tissues through a single electrode and hand piece.
  - Requires a grounding plate and energies at 2.2-6.0 MHz
  - Energy penetrates up to 20 mm
    - Dermal layer
    - Fat layer
Monopolar vs. Bipolar

Monopolar Electrode
Deeper penetration of heat - Monopolar devices have one “active” electrode and a “passive” return electrode - current runs from the active electrode, through the body, and is returned at the return pad.

Bipolar Electrode - More Superficial heating - the current flows back and forth between the two electrodes, and tissue is heated below and between both.
Combined IR with bipolar RF and mechanical massage
- RF to target septa and fat; IR thought to promote collagen production, vascular flow

Sadick et al: 35 female patients (20 treated biweekly for 4 weeks; 15 treated biweekly for 8 weeks)
- All patients: reduction in thigh circumference, skin texture, and appearance of cellulite
- Those treated for 8 weeks saw higher levels of improvement
- No statistical testing; NO DIFFERENCE B/W TREATED & UNTREATED SIDE ON HISTOLOGY

Alster et al: 20 adult women with moderate cellulite treated biweekly for 4 weeks to inner thigh & buttock area
- Patients presented for follow-up treatments at 1, 3 and 6 months after the completion
- 18 out of 20 patients reported seeing an improvement in the appearance of their cellulite, with the average graded score being 1.82 (0-3) one month after the completion of treatment.
- However, when they were reassessed at follow-up appointments, their graded score dropped from 1.82 to approximately 1.4 at the 3 month visit and to about 1.1 at the 6 month visit
- Possible need for treatment in intervals in order to maintain results

Over 8 years. Three months after a series of eight twice-weekly VelaSmooth treatments (20 W RF, 20 W IR, 200 mbar vacuum), significant improvement of her condition was observed (Fig. 1B).

CASE 2
A 25-year-old woman with a history of diabetes presented with moderate thigh and buttock cellulite (Fig. 2A). No prior treatments had been received. One month after a series of eight twice-weekly VelaSmooth treatments (20 W RF, 20 W IR, 200 mbar vacuum), mild clinical improvement was evident (Fig. 2B). Note: Similar clinical results would be expected from the TriActive device.

SUMMARY
The focus of this discussion was to outline the treatments that have a positive effect on cellulite in a clinical setting, given the systems currently available. Despite the prevalence of cellulite and the popularity of various cellulite treatments, there remains a relative lack of basic and clinical research in the area. In an ideal world, prolonged or even permanent improvement of cellulite would be possible. Unfortunately, the transient nature and significant variations in clinical efficacy from the use of over-the-counter products and massage-based therapies are the norm. Even the two FDA-approved combination laser systems have their limitations, but at least yield better and more prolonged clinical results than other therapies.

In practice, a series (eight or more) combined IR light/C6 RF and mechanical negative tissue massage treatments are recommended on a twice-weekly basis, followed by monthly treatments thereafter to maintain and further enhance the clinical effect. Adherence to this protocol, along with a healthy sense of realism, keeps patient (and physician) expectations in check. In addition, a reasonable diet and exercise plan facilitates and enhances the process.

Fig. 1. Posterior thigh and buttock cellulite before (A) and three months after a series of eight twice weekly VelaSmooth treatments (B).
Fig. 2. Posterior thigh and buttock cellulite before (A) and one month after a series of eight twice-weekly VelaSmooth treatments (B).

Alster et al:
30 minute treatment session
20 W RF
20 W IR (700-1,500nm) light
200 mbar vacuum
mild erythema / edema
Retreated 2x per week
8 Sessions
Monthly maintenance treatments
Combination of infrared (IR), bipolar radiofrequency (RF), vacuum, and mechanical massage

Brightman et al: 19 individuals underwent 5 weekly treatments to the upper arms; 10 had 4 weekly treatments to abdomen and flanks
- Change in arm circumference was significant at 5 weeks (-0.625cm)
- At follow-up of 1 month (-0.71cm) and 3 months (-0.597cm)
- Reduction of abdominal circumference was significant at 3 weeks (-1.25cm) and at follow-up of 1 month (-1.43cm) and 3 months (-1.82cm)

Winter: 20 postpartum women underwent 5 weekly treatments to the abdomen, buttocks, and thighs
- Mean circumference reduction 5.4 cm
- Improvement in skin laxity and tightening per physician and patient
- No major side effects or safety concerns

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Low-level, dual-wavelength (650/915) laser energy and massage

Lach: 74 patients completed the study in which one thigh was randomized to SmoothShapes vs. massage alone (control). Average 14.3 treatments over 4-6 weeks. Response assessed with MRI.

- Fat thickness decreased by 1.19cm² with SmoothShapes, and increased by 3.82cm² in the control leg
- Overall ~82% responded to treatment

Gold et al: Multicenter study of 83 patients with mild to moderate cellulite who received 8 treatments to one leg with SmoothShapes, with the opposite leg serving as a control.

- Reduction in thigh circumference was noted for all treatment areas (upper, middle, and lower thigh)
- Greatest reduction (-0.82cm) seen in upper thigh at 1 month follow-up
- Statistically significant mean reduction seen in the treated thigh (-0.64cm) as compared to the untreated thighs (-0.20cm) (p < 0.0001).

References:

2 weeks post 9 treatments; SmoothShapes: 650 nm at 0.5 W and 915 nm at 1 W

MRI shows decrease circumference of treated thigh
Accent XL™

- FDA-approved (wrinkles / rhytids) radiofrequency device - **unipolar head** - Heats up to 20 mm depth

- **Bipolar RF** – superficial heating & **Unipolar RF** – deeper heating

- Alexiades et al: 10 female patients each had one leg randomized to treatment every other week for an average of 4.22 treatments.
  - At **3 month follow-up**, there was improvement in cellulite dimple density (11.25%), distribution (10.75%), and depth (~2%).
  - Overall improvement of 7.83% in the appearance of cellulite

- Goldberg et al: 30 patients with upper thigh cellulite were treated every other week for 6 treatments.
  - Evaluation before and **6 months** after treatment
  - 27 subjects showed clinical improvement with mean decrease in leg circumference -2.45cm
  - Histologic examination showed dermal fibrosis of the upper dermis


Results of a survey of 5,700 patient monopolar radiofrequency facial skin tightening treatments: assessment of a low-energy multiple-pass technique leading to a clinical end point algorithm.

Dover JS¹, Zelickson B; 14-Physician Multispecialty Consensus Panel.

Abstract

INTRODUCTION: Monopolar radiofrequency is an effective means of nonsurgical facial skin tightening.

OBJECTIVE: The objective of this study was to determine whether using larger tips at lower energy and multiple passes, using patient feedback on heat sensation and treating to a clinical end point of visible tightening, would yield better results than single passes with small tips at high energy, as measured by patient and physician satisfaction.

METHODS: Fourteen physicians from four specialties were surveyed to determine the answers to the following three questions. (1) Is patient's feedback on heat sensation a valid and preferred method for optimal energy selection? (2) Do multiple passes at moderate energy settings yield substantial and consistent efficacy? (3) Is treating to a clinical end point of visible tightening predictable of results?

RESULTS: A total of 5,700 patient treatments were surveyed. Comparisons were made using the original algorithm of high-energy, single pass to the new algorithm of lower energy and multiple passes with visible tightening as the end point of treatment. Using the original treatment algorithm, 26% of patients demonstrated immediate tightening, 54% observed skin tightening 6 months after treatment, 45% found the procedure too painful, and 68% of patients found the treatment results met their expectations. With the new multiple-pass algorithm, 87% observed immediate tightening, 92% had the tightening six months after treatment, 5% found the procedure too painful, while 94% found the treatment results met their expectations.

CONCLUSIONS: Patient feedback on heat sensation is a valid, preferable method for optimal energy selection in monopolar radiofrequency skin-tightening treatments.
The use of hybrid radiofrequency device for the treatment of rhytides and lax skin.

Friedman DJ¹, Gilead LT.

Abstract

BACKGROUND: Recently, radiofrequency (RF) devices have been introduced and commercialized for nonablative procedures in dermatology and plastic surgery for the treatment of age-related rhytides and lax skin.

OBJECTIVE: The objective was to assess the efficacy and safety of a novel RF device (Accent, Alma Lasers, Ltd, Caesarea, Israel) for the treatment of rhytides and lax skin.

METHODS AND MATERIALS: Sixteen female patients (age range, 29-66 years; mean, 47 +/- 6 years; skin phototypes II to IV) were treated with Accent system. Patients were treated on the chin (n=5), forehead (n=8), cheeks (n=12), jowl lines (n=9), periorbital area (n=7), marionette line (n=3), and nasolabial folds (n=6) for wrinkles (n=27 cases) and skin laxity (n=23 cases). Patients received two to six treatments (mean, 4.3 +/- 1.1), with the time interval of 2 to 3 weeks. Photographs were assessed 1 month after the last treatment. RESULTS For wrinkles and skin laxity, in 5 patients (42%), the cheeks (n=12) scored 51% to 75% (significant improvement), and 2 patients (17%), 76% to 100% (excellent improvement). For the jowl lines (n=9), 4 patients (44%) scored 51% to 75% (significant improvement), and 1 patient scored 76% to 100% (excellent improvement) for lax skin. For wrinkles on the periorbital (n=7) and forehead areas (n=8), three patients (37%) scored 51% to 75% (significant improvement).

CONCLUSION: The Accent system is an effective and safe modality for the improvement of age-related rhytides and lax skin.
The Exilis is indicated for the primary treatment of dermatologic and general surgical procedures for non-invasive treatment of wrinkles and rhytids. The massage device is intended to provide a temporary reduction in the appearance of cellulite.
MonoPolar RF with Precise Depth of Penetration

- Exilis ULTRA
- Monopolar Radiofrequency and Ultrasound
- Focused Thermal Effect with Advanced Controlled Cooling
- No Disposable Costs
- Total Body Applications
Body Applicator To Enhance Safety

- Exilis Infrared thermal sensor on applicator gives real-time skin temperature readings.
- All treatment controls on applicator.
- Visual warning on screen and audible alarm if skin contact is compromised.
Fractional Radiofrequency

- Examples: Primaeva Medical Renesis, Syneron eMatrix
- Improvement in skin texture and reduced wrinkles
- Erythema post procedure
- Painful
- Increases type I and III collagen and decreased elastin at 3 months post treatment
Ultrasound

- Ultrasound (focused and non-focused)
- low energy non-focused ultrasound and low energy electrical stimulation and suction
- Examples: Ultera® (focused), Bella Contour® (non-focused)
  - Initially developed micro-focused ultrasound for non-invasive treatment of liver cancer
  - Visualization of tissue, fat and bone
  - Imaging 8 mm below the epidermis
  - Painful. Tissue temperature 65-70°C
  - 86% response rate. Patient selection is important and critical
Laser: Infrared Wavelength

- Example: Cutera Titan®
- Light source generates energy from 1100 to 1800 nm for safe and effective volumetric heating of the dermis.
- Safe for all skin types
- Requires several sessions
Conclusion: Many Options

- A variety of energy and light based devices available
- Baseline severity matters

Non-invasive devices

- Least invasive
- Short follow-up studies
- Results may be shorter in duration
- Possible need for maintenance treatments - ? DURABILITY

Invasive laser delivery

- More invasive
- Longer follow-up shows lasting results
- Possibility of a single treatment

MUST MANAGE EXPECTATIONS
THANKS

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