Non-invasive Body Contouring

David J. Goldberg, MD
Skin Laser & Surgery Specialists
NY/NJ
Disclosure

- Research Grants: Syneron, InMode
Approaches

- Radiofrequency
- Ultrasound
- “Cold”
- Facial
- Body Contouring (Cellulite)
- Body Shaping
Facial Approaches

- Radiofrequency
- Ultrasound
RF

- Monopolar (Solta Thermage and BTL Exelis)
- Bipolar (Velashape, Accent Vshape, etc)
Types of RF

- Monopolar (Solta Thermage and BTL Exelis)
Monopolar RF

- Monopolar systems deliver current by using one electrode that contacts the skin and another that acts as a grounding pad.

- The skin tightening effect is based on the principle of volumetric heating. The electrode contacting the skin delivers the electric current to the skin. A reverse thermal gradient is created by cooling of the epidermis.
Monopolar RF

- The dermis is then heated uniformly and volumetrically, sparing the epidermis. Partial collagen denaturation occurs as a result of this heating, which leads to collagen contraction and thickening.

- Some contraction of the collagen framework may occur immediately due to the fibril denaturation. More tightening follows due to a natural inflammatory wound healing response that triggers neocollagenesis and further skin contraction.
Bipolar

- Monopolar RF has one active electrode on the skin and a grounding pad
- Bipolar RF has 2 active electrodes placed short distance apart
Bipolar

- Current flows between the 2 electrodes
- More superficial penetration when compared to monopolar RF
How Bipolar Works?

- The Bipolar handpiece applies both electrodes at the treatment site. Electrical energy and the heat caused by the displacement of charged particles, are localized in a small area. **Bipolar energy only penetrates superficially (up to ~6 mm) and effects only the area between the electrodes.**
Clinical Results

- Bipolar RF used for superficial skin tightening
Approaches

- Ultrasound
Ultherapy
Surgical Precision in a Non-Invasive Device

The patented imaging capability of Ulthera transducers lets you see where you’re treating. Ulthera transducers micro-focus ultrasound energy below the skin to non-invasively denature collagen.

Ulthera® DeepSEE® image of the lateral neck and histology of the same tissue.
Body Contouring

- Radiofrequency
- Ultrasound
- “Cold”
Types of RF

- Unipolar (Accent V shape)
Unipolar

- No electric current to the skin
- High frequency EMR at 40MHz to induce rotational oscillations in water molecules
- Action akin to microwave energy
- Production of heat to depth of 15-20mm
How Unipolar RF Works

- Polarized molecules try to line themselves up with the electrical field, like compass needles trying to point at North.

- But because the electrical field is changing 40 million times a second, the molecules don't quite have time to line up one way before they have to try to line up the other way!

- The rapidly oscillating electromagnetic field causes movement (a rotation) of water molecules within the tissue. The resistance to this movement creates friction and deep heat. This is similar to your microwave oven at home.
Body Contouring-Ultrasound

- Ultherapy (Ulthera)
- Liposonix (Valeant-Solta)
- Ultrashape (Syneron-Candela)
Body Contouring-Ultrasound
Dermatol Surg 2014

- Ultherapy (Ulthera)
Study Design

- Prospective, single-center clinical trial
- Split-body
- Single-blinded (masked assessments)
- N=30
- Skin laxity in buttocks and thighs
Study Design

- Each subject was treated on one buttock using micro-focused ultrasound with visualization.
- The contralateral side was an untreated control.
- Treatment was undertaken using 7MHz (3 mm focal depth) and 4 MHz (4.5 mm focal depth) transducers.
Focused Ultrasound

- Liposonix (Valeant-Solta)
- Ultrashape (Syneron-Candela)
<table>
<thead>
<tr>
<th></th>
<th>UltraShape</th>
<th>Liposonix</th>
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</thead>
<tbody>
<tr>
<td><strong>Technology</strong></td>
<td>Non-thermal Selective Focused Ultrasound</td>
<td>High Intensity Focused Ultrasound (HIFU)</td>
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<tr>
<td><strong>Ultrasound Effect</strong></td>
<td>Non-thermal Mechanical Acoustic Effects</td>
<td>Thermal Effect</td>
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<tr>
<td><strong>Mechanism of Action</strong></td>
<td>Fat cell destruction by means of <strong>mechanical disruption</strong> <em>(cavitation)</em></td>
<td>Cell death through **thermal coagulation and necrosis*²</td>
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<tr>
<td><strong>Tissue Temperature Increase</strong></td>
<td>&lt; 1°C increase in temperature within focal volume</td>
<td>&gt; 70°C increase in temperature within focal volume</td>
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</table>
UltraShape® Histology
In-vivo Porcine Model: Acute Effects

Control

Single Treatment

Fat Cell Disruption (lysis)

X 40

S.Brown et al PRS Advance Online, January 2009
Body Contouring

- “Cold” (Coolsculpting)
New RF Approach

- Needle Bipolar
Body Contouring

- Deep Microneedle Bipolar RF (Syneron ePrime and Lutronic Infini)


A Pilot Clinical Study to Determine the Safety and Performance of the ePrime System (Non-ablative Radiofrequency Energy) for the treatment of Cellulite

ASLMS 2014
Product Design

- 5 pairs of electrically-isolated 32 gauge needles
- 6 mm length; insulated; specially beveled to maintain sharpness
- Fractionated zones of thermal injury created in and limited to the deep dermis (1-2 mm deep into the skin)
Study Objectives

- To establish the efficacy of a single ePrime treatment of the buttocks skin for safe and effective treatment of cellulite
Study Design

- Prospective, single-center, randomized clinical trial
- Split-body
- Blinded assessments
- N=10
- Cellulite
- One treatment
- One and three month follow-up
Each subject was treated on one buttock/thigh using the ePrime system.
The contralateral side was the untreated control.
Treatment was undertaken by setting the target temperature to the maximum tolerable amount.
One treatment, one month and three month follow-up.
Treatment Area

Five pairs of 32 gauge electrode placed into dermis

Insertions numbers were a minimum of 50 insertions per side

Target number of insertions was based on subject size, comfort and reaction

Insertion spacing was no less than 3mm

No overlap of insertions
Results: Investigator Improvement Scores

**Investigator Improvement Scores**

- Statistically significant improvement in cellulite and laxity
- Significant linear effect over three month study duration

**Subject Satisfaction Scores**

- Significant effect on subject satisfaction levels
- Significant linear effect over three month study duration

No adverse effects
Conclusion

- Bipolar radiofrequency devices, such as ePrime are an effective treatment for cellulite.
- Off-Facial
- Body Contouring
- Body Shaping
Body Shaping

- Radiofrequency (BTL Vanquish)
- Radiofrequency (InMode BodyFX)
Body Shaping

- Radiofrequency (BTL Vanquish)
Body Shaping

- Radiofrequency (InMode BodyFX)
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