1. **What's New in Skin Tightening?**

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2. **Disclosures**

- BTL, InMode, Sciton – Equipment  
- Alastin, Inmode, Sciton – Honorarium  
- Allergan, Merz, Sciton, Inmode - Scientific Advisory board  
- Merz – Data Safety and Monitoring Board

3. **Tissue Tightening Technologies**

- Ablative Laser Resurfacing (CO$_2$, Erbium)  
  - Traditional  
  - Fractional  
- Radiofrequency (RF)  
  - Monopolar, Bipolar, Tripolar  
  - Fractional  
- Non-ablative lasers (Mid-infrared)  
- MicroFocused Ultrasound  
- Suspension Sutures

4. **What's True?**

- Patient Counseling is Key  
- Set realistic expectations  
- Most patients see only a mild-moderate improvement in skin laxity  
- Results may take 3 to 6 months to see full benefit
What’s Not?

- Important to emphasize that these treatments are NOT equivalent to surgery
- No nonsurgical facelifts
- Gold standard for skin laxity remains surgical lifting procedures

Stress that results are unpredictable

- Key point: It is difficult to predict who will benefit and who will not
- May require multiple treatments

Patient Selection

- Patients with less laxity often do best
- Elderly patients with significant sagging and severe laxity are poorer candidates
- Patients that do not want to undergo surgery or are poor surgical candidates

Device Selection

- Many different technologies
- All attempt to do the same thing, namely, tighten skin laxity by the deposition of heat
- Consider patient’s lifestyle
  - How much downtime can they afford?
- Some are more painful than others
- Some require multiple treatments
- Some are more expensive

Mechanism of Action

- Controlled Instantaneous Heating
• Precise heating of collagen leads to immediate contraction from destruction of the H bonds
• Correlates to immediate tightening seen with procedures
• Stimulates new collagen deposition and fibroblast proliferation over the ensuing 3 to 6 months

10 Radiofrequency

11 Radiofrequency
• Tissue has multiple layers, i.e. dermis, fat, muscle, and fibrous tissue
• each layer has varying resistance to radiofrequency energy
• Individual variations in dermal thickness, fat thickness, fibrous septae, etc. all play a role in determining impedance, heat perception, and total deposited energy despite otherwise equal parameters

12 Monopolar radiofrequency
• Electrical current passes through a single electrode in the hand piece to grounding pad

13 Patient Selection
• For the most part, they are safe for all skin types
• Mild to moderate laxity does best
• Patients with pacemakers are contraindicated
*Remember to remove all jewelry

14 Monopolar Radiofrequency
• First device for noninvasive tightening
• No patient recovery time
• Treatment protocol has changed over time to decrease adverse side effects
• Lower energies, multiple passes
• Patient’s feedback on heat sensation is the preferred method for optimal energy selection
15 New Advances

16 Subsurface Monopolar Radiofrequency
   • Minimally invasive
   • Deposits heat right at the target tissue
   • Requires tumescent anesthesia
   • Prolonged swelling may last weeks
   • Stay away from danger zones
     • Risk of temporary nerve palsies

19 Treatment Protocol
   • Heat each section for 15 min
   • Keep probe in area until you reach target temp, then move 1 cm at a time
     • “slow movement” technique
   • Surface temp < 42°C
   • Temp at dermis ~60°C

20 Bipolar radiofrequency
   • Electrical current passes between two electrodes at a fixed distance
   • More controlled current distribution
   • Depth of penetration is limited to approximately ½ the distance between the electrodes

21 Bipolar Radiofrequency Assisted Lipolysis
   • Provide subcutaneous fat coagulation and heating of fibrous septa and papillary dermis providing significant collagen contraction
   • External temperature control 35-42°C
   • Internal temperature control 50-70°C
   • System reduces RF energy when one of the temperatures
approaches the preset limit
- Cannula length – 10cm (4”)
- Cannula diameter – 1.2mm
- Treatment depths – 3-25mm

22 **RFAL Technology**

23 **Fractional Radiofrequency**
“Microneedling with heat”

24 **Mechanism of Action**
- Thermal wounds directly in contact with microneedles are created in a fractional pattern
- Thermal damage in the deep dermal collagen, stimulates wound healing, dermal remodeling and new collagen, elastin, and hyaluronic acid formation
- Intervening areas are unaffected to serve as a reservoir of cells that promote and accelerate wound healing

25 **Indications**
- Skin tightening*
- Rhytides
- Scars
- Photodamage – telangiectasia, lentigines

26 **Pre Treatment Medications**
- Antibiotic/Antiviral prophylaxis
- Valacyclovir 500 mg bid x 5-7 days
- Doxycycline 100 mg bid x 5-7 days
- Anesthesia
  - Topical anesthesia:
    - 7% Lidocaine/7% tetracaine
    - 23% lidocaine/7% tetracaine
  - Local injected anesthesia
Tissue tightening conclusions

• Nerve blocks

27 Treatment Parameters
  • Key parameters
  • Depth determined by the length of needle
  • Density is determined by the number of needles
  • Depends on condition being treated
  • Consider pathophysiology prior to treatment for optimal results
    • i.e. laxity vs acne scars vs rhytides
  • Skin type

28 Postoperative Considerations
  • 2-10 days downtimes depending on settings and device
  • Pinpoint bleeding with some devices
  • Less downtime than fractional ablative devices

29 Bipolar Needle RF
  • Can be used on skin type V or lighter
  • Use 24 pin tip (3mm) for tightening
  • Use 60 pin tip (600u) for texture
  • Use coated tips for darker skin types

30 Silicone Coated Tips
  Thermal Injury= Epidermal Sparing

31 Ablation Histologies

32 High Intensity Focused RF

33 Intense focused coagulation up to 3.5 mm deep

34 In my experience…
  • These devices approach results seen with fractional ablative lasers
  • Easier downtime
  • Procedure tolerated well
  • More consistent for skin tightening than other devices
(comparison studies are warranted)

35 **Broadband Mid-infrared Light**

36 **Broadband Infrared Light**
- Range from 800 to 1800 nm
- Pre, parallel, and post-cooling to assure epidermal protection
- Requires an external temperature sensor
- Patient’s feedback on pain sensation directs treatment
- Requires multiple treatments
- No downtime

37 **Focused Ultrasound**

38

39 **MicroFocused Ultrasound with Visualization**
- Allows for deep, non-invasive fractional treatment at *any tissue depth*
- Treats at multiple depths
  - Far below the dermis up to 4.5 mm (1.5, 3, 4.5 mm)
- Imaging guides treatment
- Painful
  - Requires pain control with anxiolytics
- Can target nerves and cause temporary nerve palsy
- No downtime

40 **Why can’t we do better with tissue tightening technologies?**
- Limits of tissue tightening are evident
- Clearly new thinking is needed in order to produce more effective technologies
- Perhaps trying to achieve “tightening” is not the correct strategy
Elasticity

• Loss of natural skin tension with aging, is due to loss of elasticity
• Restoring elasticity may be a better goal than tightening
• Do any of our treatments actually restore elasticity?  
  • LITTLE OR NO DATA ON THIS

Suspension Sutures

• Suspension suture with bidirectional cones to provide an anchoring point in the subcutaneous tissue
• Made from Polyglycolide/L-lactide, a copolymer used as a resorbable suture
• Provides mechanical fixation of the tissue until collagen production and encapsulation of the suture in collagen take place

Suspension Sutures

• PLGA Bidirectional Implant
• Resorbable
• Immediate suspension
• Biostimulatory effect
• Minimal recovery time

Tissue tightening conclusions

• Tissue tightening can non-invasively provide improvement of skin laxity in a safe manner
• Results are unpredictable
• Do not approach results of a face lift
• Important to educate patients as to the limits of these devices prior to treatment