Top Laser Resurfacing Pearls

- **Fully Ablative Resurfacing removes epidermal changes, and lasts longer!**
  - Actinic damage is more permanently removed
  - Upper eyelids tighten significantly with low risk of scarring

- **Fractional Resurfacing is the great leveler of color and texture**
  - Gold Standard for scars
  - Non ablative 1927nm does a better job for pigment
  - 1540-1570nm is better for scars and skin quality
  - Fractional ablative with low density can be rapidly healing and increases versatility of device

- **Combining treatments increases patient satisfaction without increasing downtime**
  - Non ablative resurfacing with a tissue tightening device
  - Combining toxins, fillers and devices makes the holy grail a lot closer if done right...
  - Don’t combine toxin with procedures that cause swelling.

- **Minimizing complications**
  - Use of anti-virals is mandatory for all resurfacing around the mouth in anyone with HSV or any fully ablative tx
  - Only contraindication for fully ablative is vitiligo
  - Identifying infections/potential scarring and treating them early will save most issues
Resurfacing Lasers

• **Fully ablative lasers** – Typically 1 tx
  • \(\text{CO}_2\ 10,600\text{nm}\)
  • Erbium 2940nm

• **Fractional lasers** – Typically multiple txs
  • Ablative – \(\text{CO}_2\ and\ Erbium\)
  • Non-Ablative
    • 1440/1470/1540/1550/1565nm
    • 1927nm (Thulium)

• **Hybrid Fractional Laser** – Number of tx depends on settings
  • Erbium 2940nm + 1470nm

• Combinations of above now most popular
Laser Skin Resurfacing

• Ablative Laser Resurfacing
  • Removes full epidermis
    • Decreases risk for AK’s, BCC’s
    • Smooths out superficial growths/tumors
      • Adnexal tumors, sebaceous hyperplasia, etc
  • Excellent tightening!
  • Considerable downtime and risks, esp. hypo-, depigmentation.

• Fractional Resurfacing
  • Thousands of tiny holes either coagulated or ablated
  • Treatment effect and downtime varies with settings/laser
  • Efficacy better for neck, chest
  • Used to fix pigment and textural changes from ablative laser
  • Can combine with other lasers to increase efficacy
    • Q-Switched, LP, Vascular, 1450nm Diode
Fractional Resurfacing

Laser Pulse

Normal skin

Healing process
In-vitro Characterization of Ablative Fractional Laser Treatment
Non-ablative fractional DUAL 1550/1927 Laser

Histology Comparison: 20mJ

Non-ablative fractional DUAL 1550/1927

Similar lesions

Non-ablative fractional DUAL 1550/1927

Non-ablative fractional Fractional Ablative CO₂ ablative

Similar lesions

Non-ablative fractional Fractional Ablative CO₂ ablative

Comparable lesions
ProFractional-XC Tunable Coagulation

Optional and User-Controlled Coagulation

- Control the amount of heat delivered independent of ablation depth
  - YSGG and CO2 lasers can only deliver ablation in conjunction with thermal injury
- Optimize the ratio of ablation and thermal zone
  - Increase coagulation for more collagen production
So....
What is the best proportion of ablation and Coagulation for maximal results?

Depends on the desired result for what you are treating....
Fractional Resurfacing

• Laser variables
  • Wavelength
  • Power of machine
    • Energy in mJ
  • Density or % coverage
    • % heated/coagulated and % ablated tissue

• Histological variables
  • Depth and width of lesions
    • Ablated portion only
    • Surrounding coagulation
Non-ablative Fractional Resurfacing

- Works well for pigment, textural and vascular changes
  - Non-ablative fractional 1540, 1550, 1565 nm erbium laser
- Produce MTZ (Micro Thermal Zone)
  - Up to 1500 microns deep
  - Healing by lateral reepitheliazation
  - MENDs “bronzing” up to 1 week
- Minimal aftercare needed- ice/hydration as needed
- Swelling but not painful in post op period
- Can use other lasers at same time
  - pigment, vascular, sculpting
Ablative Fractional Resurfacing

CO$_2$ (10600 nm) & Erbium (2940nm)

- Actually ablates/removes tissue.
  - Think cheddar cheese going to swiss cheese!
- “Single” tx - harder to live through but more efficacious results.
- Typically get bleeding (higher energy) and significant swelling (higher density)
  - But holes close rapidly and still only a few days of downtime.
  - More risky and more downtime than non-ablative.
- More rapid improvement in flexibility
  - Can have same day improvement
Following the laser pulse, the resulting “ablated column” is narrower due to immediate contracture.

Within 24-36 hours, the surface opening closes to prevent introduction of contaminants and to speed the healing process.

By 1 week tissue sloughs and new collagen begins forming.
Fully Ablative vs Fractional for Tightening

• Fully ablative always better for tightening
  • Eyelids and cheeks/sagging always look better!
  • Eyelids rarely have any long term side effects even with aggressive settings and infection
    • Nearly as good as upper lid bleph, and don’t get puckering
  • Cheeks more treacherous and can get pigment changes
    • Often do single pass with fully ablative and rest with fractional ablative

• Fractional ablative best for lower eyelids
  • Tightening/ectropion is bad
  • Fractional thickens up skin and makes it more springy so it looks more natural
  • Can do single pass with fully ablative followed by fractional but typically lighter than what we do for upper eyelids
CO$_2$LD: Low Downtime Fractional Ablative Resurfacing

Protocol for fractional CO$_2$ resurfacing with:

- Significant decrease in downtime
- Downtime is much better tolerated
- Decreased pain with treatment
- Decreased risk of infection
- Better night sleep for MD...
1. **Focused Lesion Remodeling:**
   Treat only rhytids (scars) with small spot size with at density of 10-15%, 10-15mj

2. **Deep Layer Remodeling**
   1st overall pass 1%, 60mj (1.5mm)

3. **Mid Layer Remodeling**
   2nd overall pass 5%, 10-15mj (300-450 μm)

- Consider total tissue treated- Density x Depth
- Always start with Focused Lesion Remodeling (swelling masks lesions) then can do in any order
CO$_2$LD: 3 Passes Overall

- **Focused Lesion Remodeling**
  - 15mJ 10%
  - (400um deep – along rhytid)

- **Deep Layer Remodeling**
  - 60mJ 1%
  - (1.8mm deep - over area)

- **Mid Layer Remodeling**
  - 10-15mJ 5%
  - (400um deep - over area)
CO_{2}LD: Results

Treated perioral area of 30 patients (1 to 3 treatments)

Evaluated:

• Downtime: Preferred by 28/30, 2 preferred non ablative, no bleeding post 24 hours
• Risk of Infection: No infections
• Pain during procedure: Well tolerated by all
• Patient satisfaction: 30/30 satisfied or very satisfied, most patients wanted to add new tx areas and paid!
OCT Imaging to see Depth of Scar
Why Fractional CO$_2$?

- Use of Fractional CO$_2$ maximizes improvement while lowering risk of hypopigmentation and scarring
  - May extend length of improvement when using deep fractional settings
  - Shortens healing time
- Can start with fully ablative to smooth out nodular (or even cutting mode) then do fractional ablative
  - May decrease risk of recurrence with less downtime than more aggressive fully ablative
- Even with highly aggressive settings they heal in 7-10 days
- CO$_2$ has more coagulation, so less bleeding!
Caveats of Combining Treatments

- **Toxin with Filler**
  - Can’t massage post poly-L-lactic acid (Sculptra) in areas where botulinum toxin was placed

- **Toxin with Laser**
  - Can’t do toxin same day as Fractional lasers - swelling can lead to migration
  - But can do botulinum toxin with PDL, IPL, CoolTouch, SmoothBeam, Thermage, Titan

- **Filler with Laser**
  - Can do filler same day but do first if doing fractional as swelling can mask need for filler.

- **Fractional with RF tightening**
  - Same day - do RF 1st because need intact skin but when you do Fractional laser over the top of RF the skin is sensitive.
Keeping Resurfacing Safe

• Post-op Diligence
• Close watch for potential complications in first 10-14 days
  • *Watch for pain, purulence, itching, increased redness*
• Possible Infection
  • Pain/purulence/redness → culture, change to quinolone
  • Pain similar to HSV → zoster doses of valtrex
  • Itching/redness
    • *? yeast → fluconazole or itraconazole*
    • *? Contact derm → d/c contactants, topical steroids,*
    • *Not sure → do both*
• Acneiform lesions – often acne-prone to begin with, use aquaphor
  • *D/C emollients asap, topical abx, culture if unusual, often can start retinoids sooner in these pts*
Later complications to watch for...

- **Hyperpigmentation**
  - Common in darker skin types, never seen it be permanent
  - Start good zinc oxide at one week
  - Start HQ/RA/steroid at one month or when noted

- **Hypopigmentation**
  - Educated about actinic bronzing removal at consult ?!??
  - Adequate feathering of tx’d skin into surrounding actinically bronzed skin?
  - Permanent hypopigmentation about 1%, ? Vitiligo, “fragile melanocytes”
  - Can try fractional resurfacing, pulsed dye laser, excimer laser...

- **Possible scarring**
  - Pulsed dye laser as soon as see any hint and repeat tx at 3-4 week intervals, can use intralesional steroids, get help!
Summary

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  - Fractional ablative with low density can be rapidly healing and increases versatility of device
- Combining treatments increases patient satisfaction without increasing downtime
  - Can keep it simple
  - Non ablative resurfacing with a tissue tightening device
  - Combining toxins, fillers and devices makes the holy grail a lot closer if done right...
  - Don’t combine toxin with procedures that cause swelling.
    - Fx + toxin = droop
    - Poly-L-lactic acid injection + toxin = droop
- **Minimizing complications**
  - Use of anti-virals is mandatory for all resurfacing around the mouth in anyone with HSV or any fully ablative tx
  - Identifying problems and treating early will save most issues
  - Pre and post tx regimens do seem to matter