Techniques for Scar Revision

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Types of Surgical Scars
- Red “Scars” – Post inflammatory erythema
- Hyperpigmented/hypopigmented
- Atrophic Scars
- Spread scars
- Hypertrophic
- Pin Cushion
- Keloid Scars

Managing Expectations
- Complete resolution of scarring is difficult
- Requires multiple treatments
- Takes several months to see full benefit
- Downtime
- Financial considerations

When to start treatment?
- Earlier the better
- At suture removal
- May improve healing time

Disclosures
- Aerolase – Scientific Advisory Board, Equipment
- Alastin – Paid consultant
- Allergan – Stockholder, Scientific advisory board, speaker’s bureau
- BTL – Equipment
- Cutera – Paid consultant
- Dermaflash – Paid spokesman
- Inmode – Honorarium, Scientific Advisory board, Speaker’s bureau, equipment
- Merz – Data safety monitoring board, Scientific Advisory Board
- Revance – Primary Investigator
- Rodan + Fields – Scientific Advisory board
- Soliton – Scientific Advisory board, Equipment
- Sienna Biopharmaceuticals – Scientific Advisory board, Primary Investigator

Combination Treatments
- Most scar require multiple modalities
  - Vascular laser first
  - So you don’t exacerbate erythema
  - Pigment specific laser
  - Followed by resurfacing device
  - Augment with filler
Surgical Scars

Red Scars

- Will fade with time
- Treating with laser speeds up recovery
- Vascular laser
  - KTP
  - PDL
  - IPL
- Studies favor low fluence/short pulse duration

Red Scars — Will fade with time — Treating with laser speeds up recovery — Vascular laser — KTP — PDL — IPL — Studies favor low fluence/short pulse duration

PDL

- Targets oxyhemoglobin to destroy blood vessels in the dermis
- ~3-4 treatments q month
- Short pulse duration, low fluence
- Improves erythema and induces collagen remodeling
- Split-face study, 22 patients with erythematous, and/or hypertrophic facial acne scars, 1 or 2 treatments with 595nm PDL, ~3 treatments, 532nm, decreased erythema/scarring by 68%.
- Heat diffuses into the surrounding dermis and results in increased TGF-β which stimulates fibroblasts

KTP – 532nm Laser

- A single-blinded, split-scar study comparing the efficacy of KTP to 595nm PDL in reduction of erythema in surgical scars found no significant difference
- The thermal energy delivered by KTP extends only to the papillary dermis, making it useful for PIE without significant effects on collagen remodeling
- Cohen BC, Weaver JR, Geronemus RD. 2016;60:90-115
IPL
• Broadband light sources -> emit multiple wavelengths
• Use cut-off filters to target various chromophores
• Advantages
  • Larger spot size allows for deeper penetration and faster treatments
  • Beneficial in patients with both pigmentary/vascular issues
  • Does not typically produce purpura
• Disadvantages
  • Significant melanin absorption depending on filters
  • Greater risk of pigmentary change

Hyperpigmented Scars
• Pigment Laser
  • 1927 nm thulium
  • QS/Pico – consider PIH
  • Apply clobetasol immediately post treatment
  • Consider Post treatment with course of hydroquinone
Hypopigmented Scars

- Inactive melanocytes
- Bimatoprost synthetic prostanoid analog which decreases intraocular pressure and has been associated with periocular skin hyperpigmentation, possibly due to increased melanogenesis
- Apply immediately after laser treatment
- Continue topical bimatoprost 0.03% twice daily for at least 3 months

Hypopigmented Scars

Surgical Scars

- Red Scars
- Atrophic

Hyper/Hypopigmented Scars

Atrophic Scars

- Subcision
- Lasers
- Needle RF
- Fillers, Biostimulators

Subcision for Tethered Atrophic Scars

- Best suited for rolling acne scars but may have a place in surgical scars
- Insert a needle under the scar to sever the fibrous components that anchors the scar
  - 18- or 20-gauge tri-beveled hypodermic needle or an 18-gauge Nokor™
- Release elevates the scar & produces new collagen without recreating a depression
- Multiple treatments may be required
- Adverse events: depression recurrence, swelling, bruising, bleeding, and infection

Lasers

- Nonablative, Ablative, Fractional Laser resurfacing stimulates dermal fibroblasts to replace lost collagen and elastin
- Traditional ablative lasers offer impressive clinical results but are associated with significant peri-procedural discomfort, prolonged recovery, and a significant risk of side effects
- Non-ablative lasers are more tolerable with shorter recovery times
- Multiple sessions are required and results are often less clinically impressive
Fractional Photothermolysis of Surgical Scars

- Pattern of multiple columns of thermal damage
- Pixilated pattern of treatment
- Does not affect surrounding tissue
- Leave untreated, viable surrounding tissue as reservoir for rapid healing
- Minimizes adverse effects
- Removes scarred collagen and induces collagen remodeling

Key points:
- Early intervention is key
- Scars respond best to high fluence, low density

Nonablative resurfacing

Fractional Resurfacing

Fluence determines your depth

Density determines your aggressiveness

Fractional Ablative Resurfacing
Combination PDL and Fractional CO2

- Simultaneous 1470/2940 nm wavelengths
- 1470 nm coagulation
  - Targets dermis and epidermis
- 2940 nm ablation
  - Targets stratum corneum and epidermis
  - May promote faster healing time
- Approaches Ablative Fractional Results
- Non-Ablative Downtime

Hybrid ablative and non-ablative fractional laser

- Targets dermis and epidermis
- 1470 nm coagulation
- 2940 nm ablation

Hybrid Laser Resurfacing

Fillers

- Augment soft tissue in atrophic scars
- Temporary fillers – (HA)
  - Repeated treatments necessary, which increases cost
- Semi-permanent fillers (Poly-lactic acid, Calcium hydroxylapatite)
  - Lasts up to two years
  - Biostimulatory
- Caution* Permanent fillers (Silicone, Polymethylmethacrylate - synthetic permanent filler suspended in bovine collagen and lidocaine)
  - Adverse effects include lumps, nodules, granulomas

Z- Plasty for Hypertrophic

- Changes the orientation of a scar
- Elongates a contracted scar
- Disrupts its linearity
- Two adjacent triangular flaps are made with a "Z"-shaped incision and are transposed with each other
- Classic Z-plasty has equal triangular flaps drawn at angles 60° from the central limb of the "Z"
Hypertrophic Scars

- Fractional ablative laser
- Topical triamcinolone acetonide
- High fluence, low density
- 5 FU/ILK 40:1

Earlobe Keloid

- Shave removal
- Light cautery
- IL Triamcinolone acetonide 40 mg/cc
- Let heal by second intent
- Compression earrings 2-3 weeks post op

Botulinum Toxin for Keloid Scars

- Fanous 2019 reference

Ice Pick Scars

- Narrow, V-shaped epithelial tracts have a sharp margin that extends vertically to the deep dermis or subcutaneous tissue
- Resistant to conventional skin resurfacing options
- CROSS Technique
- Punch excisions
CROSS Technique
- Chemical Reconstruction of Skin Scars
- Indicated for icepick and narrow boxcar scars
- TCA peel (65-100%) applied to the base of the scar to ablate the epithelial wall to promote dermal remodeling
- May require 3-6 treatments
- May result in PIH in darker skin types

Punch Excisions
- Indicated for icepick and boxcar scars
- 2 mm punch biopsy closed with a suture vs secondary intention healing
- A scar is created but is less noticeable because of change at the depth of the base
- Follow with laser resurfacing at suture removal

Conclusion
- Multifactorial approach
- Treat redness first
- Set reasonable expectations

Thank you! Follow me @arisaortizmd