Academic Appointments

- Assistant Clinical Professor
  - Department of Medicine, Division of Dermatology, Nashville, TN USA
  - Vanderbilt University School of Medicine: 2006 - 2014
  - Vanderbilt University School of Nursing: 2006 - Present

- Adjunct Assistant Professor
  - Meharry Medical College: 2013 - Present
  - School of Medicine, Nashville, TN USA

- Visiting Professor of Dermatology
  - Huashan Hospital, Fudan University (Shanghai Medical University), Shanghai, China: 2006 - Present
  - The First Hospital of China Medical University, Shenyang, China: 2008 - Present
  - Guangdong Provincial People’s Hospital, Guangzhou, China: 2013 - Present

- Visiting Professor of Plastic Surgery
  - First People’s Hospital of Foshan University, Guangdong, China: 2012 - Present
  - The First Affiliated Hospital of Zhejiang University, Hangzhou, Zhejiang: 2013 - Present
Consultant to many pharmaceutical, cosmeceutical, laser and energy-based device companies

Consultant, performs research and speaks on behalf of numerous pharmaceutical and medical device companies

For the benefit of this presentation: consultant, investigator, Dr. Gold is a consultant for and speaks for Lumenis, Sensus and Stratpharma
Hypertrophic Scars & Keloids

One of the most challenging therapeutic problems in dermatology

What are the current treatment options?
No matter what type of therapy

Always risk of recurrence
Recurrence rates of 40-55% reported

Some new modalities showing much better overall responses in 2018
This presentation will review some of these new therapies

Are we finally at the point where we can successfully treat these lesions?
Common modalities

- Topical Silicone Gel
- Intralesional corticosteroids with or without surgical excision
- Pressure therapy
- Cryotherapy
- Laser therapy
- Superficial Radiation Therapy
Many techniques for management of hypertrophic scars and keloids have been proven through extensive use, but few have been supported by prospective studies with adequate control groups. Several new therapies showed...
Updated International Clinical Recommendations on Scar Management: Part 1—Evaluating the Evidence

Michael H. Gold, MD,* Brian Berman, MD, PhD,† Matteo Tretti Clementoni, MD,‡ Gerd G. Gauglitz, MD,§ Foad Nahai, MD,‖ and Crystal Murcia, PhD¶

BACKGROUND There is an ongoing need to standardize scar management by establishing safe and effective treatment options that can be applied in routine clinical practice.

OBJECTIVE To review available data on methods for preventing and treating cutaneous scarring.

MATERIALS AND METHODS Relevant scientific literature was identified through a comprehensive search of the MEDLINE database. Additional data and published studies were submitted for consideration by members of the International Advisory Panel on Scar Management.

RESULTS One of the most significant advances in scar management over the past 10 years has been the broader application of laser therapy, resulting in a shift in status from an emerging technology to the forefront of treatment. Accumulated clinical evidence also supports a greater role for 5-fluorouracil in the treatment of hypertrophic scars and keloids, particularly in combination with intralesional corticosteroids. Encouraging data have been reported for newer therapies, including bleomycin, onion extract-containing preparations, imiquimod, and mitomycin C, although methodologic limitations in available studies merit consideration. In general, clinical and aesthetic outcomes seem to be enhanced by a combination approach to treatment.

CONCLUSION Advances in therapeutic options and new study data necessitate a revision of algorithms for the prevention and management of cutaneous scarring.

The authors received honoraria from Enaltus, Lumenis, and Merz for their work on this panel.
Updated International Clinical Recommendations on Scar Management: Part 2—Algorithms for Scar Prevention and Treatment

Michael H. Gold, MD,* Michael McGuire, MD,†† Thomas A. Mustoe, MD,* Andrea Pusic, MD,* Mukta Sachdev, MD,* Jill Waibel, MD,* and Crystal Murcia, PhD**

BACKGROUND In 2002, an international advisory panel was convened to assess the scientific literature and develop evidence-based guidance for the prevention and treatment of pathologic scarring. Emerging clinical data, new treatment options, and technical advances warranted a renewed literature search and review of the initial advisory panel recommendations.

OBJECTIVE To update the management algorithm for pathologic scarring to reflect best practice standards at present.

MATERIALS AND METHODS Management recommendations were derived from clinical evidence amassed during a comprehensive literature search and from the clinical experience and consensus opinion of advisory panel members.

RESULTS A combination approach using multiple modalities provides the maximum potential for successful treatment of hypertrophic scars and keloids. The advisory panel advocates a move toward more aggressive initial management of keloids, including earlier application of 5-fluouracil. A growing body of clinical research supports a place in therapy for newer agents (e.g., bleomycin, onion extract, imiquimod, mitomycin C) and laser therapy (pulsed-dye, fractional) for scar management.

CONCLUSION Prevention and treatment of pathologic scarring requires individualized care built upon the principles of evidence-based medicine and continues to evolve in step with technological and scientific advances.

The authors received honoraria from Enaltus, Lumenis, and Merz for their work on this panel.
Therapies

Silicone Gel

Despite initial skepticism, there is now good evidence of its efficacy and is now one of the gold standards for scar therapy.

Combination therapy most preferable with silicone gel

> Eight randomized, control studies and a meta-study of 27 trials demonstrate its safety and efficacy

Totally occlusive dressings and semi-occlusive dressings have not shown evidence of efficacy, and evidence from other non-silicone based dressings is mixed.
Topical Silicone: Mechanism of Action

Silicone gel restores the barrier function of the stratum corneum, reducing TEWL and turning off the stimulation of keratinocytes. Keratinocytes stop producing cytokines that activate dermal fibroblasts.

After two to three months of silicone gel treatment, collagen deposition has normalized, and there is no scar hypertrophy.

Topical Silicone Gel Sheeting in the Treatment of Hypertrophic Scars and Keloids – A Dermatologic Experience

**Topical Silicone Gel Sheeting in the Treatment of Hypertrophic Scars and Keloids**

**A Dermatologic Experience**

MICHAEI H. GOLD, MD

**Background.** Topical silicone gel sheeting has been used successfully in the management of hypertrophic and keloid scars resulting from thermal burn wounds.

**Methods.** An open-labelled approach using the silicone gel sheets was performed using hypertrophic and keloid scars secondary to surgical procedures or traumatic insults.

**Results.** The silicone gel sheets resulted in moderate improvement in scar thickness, scar color and was noted to be effective to some degree in all tested. The material was easy to use and painless.

**Conclusions.** Topical silicone gel sheeting is an effective method for the treatment of hypertrophic and keloid scars and may be considered useful in the treatment of these difficult cutaneous lesions. J Dermatol Surg Oncol 1993;19:912–916.
A controlled clinical trial of topical silicone gel sheeting in the treatment of hypertrophic scars and keloids

Michael H. Gold, MD
Nashville, Tennessee

Topical silicone gel sheeting (Silastic) has gained acceptance in the management of patients with hypertrophic and keloid scars. After an initial open-labeled approach to assess the effectiveness of this treatment modality, a controlled clinical trial was conducted.

MATERIAL AND METHODS

Topical silicone gel sheeting was supplied by Dow Corning Wright. The material is a soft, semielastic, adherent covering fabricated from medical-grade silicone polymers. The silicone used is a cross-linked poly(dimethylsiloxane) polymer with no added fillers. The material has been approved by the U.S. Food and Drug Administration.

This clinical trial was divided into three separate phases. Phase I included patients with hypertrophic scars or keloids. Twenty-one patients were enrolled in this phase of the study: 17 with hypertrophic scars and 4 with keloids. All participants provided informed consent. Their lesions were divided into two equal halves with a tattoo marker of India ink. The patients were given written instructions on the use of the sheeting. The sheeting was placed on half of the scar for a minimum of 12 hours daily. The area to be treated was randomly assigned. The study was continued for a 12-week period. The scar was evaluated every 4 weeks. Both patient and physician evaluated the following features: change in thickness and color in the treated half of the scar and overall effectiveness of the product on a scale from 0 to 3 (0 = no change, 3 = complete resolution). Pictures of lesions were taken at baseline and at all treatment visits.

Phase II of the trial was designed to study the effect of the topical silicone gel sheeting in preventing recurrences after the removal of a keloid with a carbon dioxide laser. Enrollment criteria required the presence of two distinct keloids within the same anatomic body part. Eight patients were enrolled; 24 hours after operation, one of the two surgical sites was covered with topical silicone gel sheeting. Features evaluated at monthly intervals were the same as described; differences in recurrence rates were also assessed.

Phase III of the trial studied the effects of the topical silicone gel sheeting in patients with scars from thermal burns. Five patients were enrolled. Half the scars were treated as described for phase I.

RESULTS

Patient evaluation indicated that in 5 of 21 (23.8%) the scars were unchanged, 9 of 21 (42.9%) showed minimal improvement, and 7 of 21 (33.3%) had moderate reduction in scar thickness in the treated half after 12 weeks. Physician evaluation showed 2 of 21 (9.5%) with no change, 9 of 21 (42.9%) with minimal change, and 10 of 21 (47.6%) with moderate improvement.

In terms of color change toward normal, patient evaluation revealed that by 12 weeks, 5 of 21 (23.8%) had no change in the treated half, 12 of 21 (57.1%) had minimal change, and 4 of 21 (19.1%) had moderate improvement. Physician evaluation indicated 2 of 21 (9.5%) had no significant change,
Prevention of Hypertrophic Scars and Keloids by the Prophylactic Use of Topical Silicone Gel Sheets Following a Surgical Procedure in an Office Setting

Michael H. Gold, MD, Teresa D. Foster, RN, Melissa A. Adair, RN, Kim Burlison, RN, and Tammy Lewis, LPN

Gold Skin Care Center, Nashville, Tennessee

Background. Topical silicone gel sheeting has been used for more than 20 years to help reduce the size of hypertrophic scars and keloids. Its clinical efficacy and safety is well established.

Objective. To determine whether topical silicone gel sheeting can be used to prevent hypertrophic scars and keloids from forming following dermatologic skin surgery.

Methods. Patients undergoing skin surgery were stratified into two groups: those with no history of abnormal scarring (low-risk group) and those with a history of abnormal scarring (high-risk group). Following the procedure, patients within each group were randomized to receive either routine postoperative care or topical silicone gel sheeting (48 hours after surgery). Patients were followed for 6 months.

Results. In the low-risk group, there were no statistical differences between individuals using routine postoperative care or using topical silicone gel sheets. In the high-risk group, there was a statistical difference (39% versus 71%) between patients who did not develop abnormal scars and used topical silicone gel sheeting and patients who developed abnormal scars after routine postoperative treatment. Those individuals having a scar revision procedure also showed a statistical difference if topical silicone gel sheeting was used following surgery.

Conclusion. Topical silicone gel sheeting, with a 20-year history of satisfaction in dermatology, now appears to be useful in the prevention of hypertrophic scars and keloids in patients undergoing scar revision.
Radiotherapy - OLD

Radiotherapy continues to be reserved for secondary management in adults with hypertrophic or keloid scarring after other treatment options have proven ineffective.

Monotherapy remains controversial.

Combination therapy with surgery often reported.

Most trials retrospective.

Most trials do not define recurrences.
Radiotherapy – **NEW**

Superficial Radiation Therapy WORKS with excisional surgery

Literature very supportive

Recurrence rates low – reports from 1-10%

  Changes the game for many

  And with combination with topical therapies???????
Adjunct Therapies to Surgical Management of Keloids

BRIAN BERMAN, MD, PhD
HARLAN C. BIELEY, MD

BACKGROUND. The literature describing surgical treatments, with or without supplementary nonsurgical treatments for keloids, offers a confusing picture of widely variable “success” rates, recurrence rates, patient populations, and follow-ups periods.

OBJECTIVE. A review of the surgical treatment of keloids with emphasis on surgery combined with nonsurgical therapies is presented.

RESULTS. Surgery alone leads to recurrence rates ranging from 45 to 100%. When surgery is combined with intradermal corticosteroids, the recurrence rate in the majority of studies falls below 50%. Surgery combined with button compression therapy on earlobes led to no recurrences. External radiation following excision, often combined with other therapies, has been associated with recurrence rates of less than 10%. Various lasers have been used in the treatment of keloids with great variability in the recurrence rate but in general result in similar recurrence rates as conventional surgery. As with cryodestruction, laser ablation recurrence rates often are improved when combined with other treatments. Interferon-a2b injected after keloid excision demonstrated, in a small series of patients an 8% recurrence rate.

CONCLUSION. Presently, it appears that a combined therapeutic approach offers the most propitious possibility for preventing keloid recurrence. Dermatol Surg 1996;22:126−130.
Low Rate of Keloid Recurrence Following Treatment of Keloidectomy Sites with Biologically Effective Dose 30 of Superficial Radiation

Brian Berman MD, PhD1, Mark S. Nestor MD, PhD1, Michael H. Gold MD2, David J. Goldberg MD, JD3, Joshua Fox MD4, George Schmieder DO5

1Center for Clinical & Cosmetic Research, Aventura, FL
2Gold Skin Care Center, Nashville, TN
3Skin Laser & Surgery Specialists of NY/NJ
4Advanced Dermatology, NY, NY
5Park Avenue Dermatology, Orange Park, FL

The potential for recurrence of keloids at the sites of previously excised keloids is a well-recognized consequence following keloidectomy, and based on the published literature, has been reported to occur approximately in 71% of cases.1 Superficial radiation reduces wound fibroblast proliferation and enhances apoptosis.2 In this multi-center, case series, we determined the recurrence rate of keloids post keloidectomy with peri-operative treatment with a biologically effective dose 30 of superficial radiation.3 Radiation dermatitis was not reported. The most common adverse local skin reaction was transient (3-6 months) hyperpigmentation, occurring in Fitzpatrick Skin Type V-VI individuals. Hypopigmentation was noted to occur rarely. The follow-up period ranged from 1 month to 3 years, with the majority having been followed for more than 1 year. There were 9 clinical keloid recurrences in the 297 keloidectomy sites for a recurrence rate of 3.0%.

The observed 3.0% rate of keloid recurrence
Keloid scars are considerably challenging as they are often refractory to treatment and the recurrence rate using surgical excision alone is 45 to 100%.

Recurrence rates after excision with adjuvant radiation therapy range from 0% to 8.6%.

Studies suggest that x-ray radiation may prevent keloid recurrence by controlling fibroblast proliferation, arresting the cell cycle, and inducing premature cellular senescence.
## Radiation and Keloid Recurrence

<table>
<thead>
<tr>
<th>Author</th>
<th>N Lesions</th>
<th>Treatment dose</th>
<th>Follow up period</th>
<th>Non-recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berman (2018)</td>
<td>297</td>
<td>BED 30</td>
<td>1m-3y</td>
<td>97%</td>
</tr>
<tr>
<td>Yamawaki (2011)</td>
<td>91</td>
<td>10 Gy Fx within 24h of excision</td>
<td>1y</td>
<td>91%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5y</td>
<td>84%</td>
</tr>
<tr>
<td>Ragoowansi (2003)</td>
<td>80</td>
<td>3 Fx of 4Gy; total 12Gy</td>
<td>1y</td>
<td>91%</td>
</tr>
<tr>
<td>Bennett (2017)</td>
<td>84</td>
<td>5 Daily 3Gy Fx; total 15Gy</td>
<td>11 months-20 months</td>
<td>100%</td>
</tr>
<tr>
<td>Mohammadi (2013)</td>
<td>26</td>
<td>Mean 47.9 months</td>
<td>Mean 47.9 months</td>
<td>86.8%</td>
</tr>
<tr>
<td>Recalcati (2011)</td>
<td>76</td>
<td>5-year relapse free</td>
<td>5-year relapse free</td>
<td>79.9%</td>
</tr>
<tr>
<td>Sclafini (1996)</td>
<td>31</td>
<td>Corticosteroid vs RT</td>
<td>Min 1y</td>
<td>87.5% after RT</td>
</tr>
<tr>
<td>Norris (1993)</td>
<td>24</td>
<td>Range 8-12 Gy Fx; various #Fx</td>
<td>Min 2y</td>
<td>67% after steroid injection</td>
</tr>
<tr>
<td>Jones (2017)</td>
<td>50</td>
<td>13- 18Gy + PRP</td>
<td>2y</td>
<td>94%</td>
</tr>
<tr>
<td>Jones (2016)</td>
<td>44</td>
<td>13, 16 or 18Gy + PRP</td>
<td>3-11 months</td>
<td>95.5%</td>
</tr>
<tr>
<td>Jones (2015)</td>
<td>21</td>
<td>13, 16 or 18Gy + PRP</td>
<td>4-11 months</td>
<td>100%</td>
</tr>
</tbody>
</table>
Literature search was performed to identify studies dealing with the efficacy of various treatment regimens for the prevention of keloids after surgery. Biologically effective doses (BEDs) of the various radiation regimens were calculated. To effectively treat keloids postoperatively, a relatively high dose must be applied in a short overall treatment time. The optimal treatment is a radiation scheme resulting in a BED value of at least 30 Gy obtained with:

- A single acute dose of 13 Gy
- Two fractions of 8 Gy
- Three fractions of 6 Gy
- A single dose of 27 Gy at low dose rate

Radiation treatment should be administered within 2 days after surgery.
One Year Retrospective Chart Review Study

Sixty-one patients, 96 excised keloids with ≥ 1 y follow up at 4 US sites
BED 30 of SRT 70 or 100kV; usually 3 Fx of 6Gy on POD 1, 2 and 3
10.4% (10/96) treated keloids were noted to recur within 12 months.
Of the 11 recurring treated keloids:
- 8 (73%) recurred within the first 6 months;
- 2 (18%) recurred within 6 to 12 months post-treatment; and
- 1 (9%) recurred within 12 to 18 months post-treatment.

Kaplan-Meier Survival Probability cure rate of 85.6% from 24 months post-SRT treatment end onwards

Greater rate of recurrence if keloid had previously recurred or was on the chest.
At 6 months
In consideration of the 61 keloids that presented at 6-month follow-up:
Eight demonstrated recurrence, for a 13.1% 6-month recurrence rate.
Four of the 8 recurrences were clinically significant, resulting in a clinically significant 6-month recurrence rate of 6.6%.

At 12 months:
In consideration of the 47 keloids that presented at 12-month follow-up:
Ten demonstrated recurrence, for a 21.3% 12-month recurrence rate.
Five of the 10 recurrences were clinically significant, resulting in a clinically significant 12-month recurrence rate of 10.6%.
Although ionizing radiation may have long term effects, the development of calibration techniques and better treatment modalities show an incidence of radiation therapy-related cancers of less than 0.3%.

A recent review of evidence suggests that the risks of cancer following Radiation Therapy for benign disease are small, especially in older patients. However, the balance of risk vs benefit needs to be considered in younger adults and especially if RT is being considered in adolescents or children.

For the specific treatment of recurrent keloid scars, a systematic review concluded that the risk developing a neoplasm from keloid radiotherapy was low.
Therapies

Laser Therapy – becoming more popular as efficacy has increased

Carbon dioxide Lasers: +/-
Argon Lasers: -
Nd: YAG Lasers: +
Pulsed-Dye Lasers and IPL: ++
Fractional Lasers: +++
  Non-Ablative Fractional Lasers
  Ablative Fractional Lasers
Picosecond Lasers
Ablative fractional (CO$_2$)  
(for severe, huge, contracted scars)
Three for Hope Foundation
Waibel J, Beer K.

Ablative Fractional Laser Resurfacing for the treatment of a third-degree burn
The Katie Piper Foundation
Pulsed Dye Laser (PDL) has been shown to be effective for the treatment of raised hypertrophic scars

Both 585 nm and 595 nm lasers have been shown to be effective in the treatment of hypertrophic scars

**Mechanism** – PDL both destroys and inhibits the formation of small vessels within the scar

- **Penetration depth** – 0.4 to 1.2 mm
- May not penetrate deep enough to effectively destroy or prevent dilated capillaries in the deeper regions of the scar
- PDL is not effective in stopping the proliferation of fibroblasts and the deposition of collagen

**Fractional CO2 lasers with or without pulsed dye lasers in the treatment of hypertrophic scars**
Fractional CO2 has become very popular for treating hypertrophic scars

Penetrates deep into the skin, promotes fibroblast apoptosis, and collagen degradation

Combination of PDL and Fractional CO2 may be better than PDL alone

Current study, performed at The Department of Plastic and Laser Cosmetic, Hunan Provincial People’s Hospital, Changsha, Hunan, China
56 patients with immature hypertrophic scars were selected for inclusion into the clinical trial

35 males, 21 females
Age range – 3-51 years

All scars were less than 3 months old to be enrolled into the study
20 scars were from burns, 17 from scalding from hot liquid, 12 from scratches or contusions, and 7 from surgical procedures
All patients (or guardians) signed an Informed Consent

Control Group – PDL only (V Beam Perfecta)

Laser settings: 7-15 J/cm² fluence, 1.5-3 ms pulse widths, 7 mm spot size, and 30-millisecond spray, 20-millisecond delay of dynamic cooling device (DCD). The endpoint for the PDL treatment was purpura occurring in the treatment area. The patients received 2 laser treatments at 1-month intervals.
Fractional CO2 lasers with or without pulsed dye lasers in the treatment of hypertrophic scars

Treatment Group - hypertrophic scars were treated with the 595 nm adjustable pulse width PDL plus the UltraPulse fractional CO2 laser. The PDL treatment parameters and the endpoint for this therapy were the same like treatment group.

The UltraPulse fractional CO2 laser was used in the scanner mode so that all of the scars were treated with the following laser settings: Model: Deep FX, Energy: 30~50 mJ, Frequency: 300 Hz, Density 5%, Scan Shape, and Spot Size were determined by the shape and the area of the scar, following treatment with the 595 nm adjustable pulse width PDL.

The time between laser treatments in this Treatment Group was 3 months.
Photographs were obtained after the second laser treatment in both the Treatment Group and the Control Group (Treatment group: Photographs were taken 2 months after the first treatment, and Control group: Photographs were taken 6 months after the first treatment).

Clinical efficacy was evaluated by the physicians who were not directly involved in the actual laser treatments and follow-up visits using the Vancouver Scar Scale (VSS).
## Vancouver Scar Scale (VSS)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Characteristic</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melanin</td>
<td>Hyperpigmentation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Mixed pigmentation</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Hypopigmentation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Normal color that closely resembles the color over the rest of one’s body</td>
<td>0</td>
</tr>
<tr>
<td>Height/mm</td>
<td>&gt;4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2-4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1-2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>&lt;1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Normal (flat)</td>
<td>0</td>
</tr>
<tr>
<td>Vascularity</td>
<td>Purple</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Pink</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Normal color that closely resembles the color over the rest of one’s body</td>
<td>0</td>
</tr>
<tr>
<td>Pliability</td>
<td>Contracture (permanent shortening of scar producing deformity or distortion)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Banding (rope like tissue that blanches with extension of scar)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Firm (inflexible, not easily moved, resistant to manual pressure)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Yielding (giving way to pressure)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Supple (flexible with minimal resistant)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>0</td>
</tr>
</tbody>
</table>
Fractional CO2 lasers with or without pulsed dye lasers in the treatment of hypertrophic scars

The total score of VSS and score of melanin, height, vascularity, pliability of the Control Group, and the Treatment Group both demonstrated an obvious decrease in the VSS scores after the treatments when comparing the before and after score numbers on the VSS.

Both groups showed statistically significant differences between the before and after treatment levels by the statistical analysis performed (P < .05).

The total score of the VSS, as well as the scores of melanin, height, vascularity, pliability in the Treatment Group, decreased more than that of Control Group when the groups were compared, and this was also statistically significant (P < .05)
# VSS Score of Treatment Group and Control Group

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Treatment Group (28 cases)</th>
<th>Control Group (28 cases)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before treatment</td>
<td>After treatment</td>
<td>t</td>
<td>P</td>
</tr>
<tr>
<td>Total score</td>
<td>10.29±0.66</td>
<td>4.46±1.50</td>
<td>18.11</td>
<td>0.00</td>
</tr>
<tr>
<td>Melanin</td>
<td>2.36±0.49</td>
<td>1.07±0.94</td>
<td>6.79</td>
<td>0.00</td>
</tr>
<tr>
<td>Height</td>
<td>2.96±0.19</td>
<td>1.25±0.44</td>
<td>19.72</td>
<td>0.00</td>
</tr>
<tr>
<td>Vascularity</td>
<td>2.04±0.19</td>
<td>0.64±0.87</td>
<td>8.86</td>
<td>0.00</td>
</tr>
<tr>
<td>Pliability</td>
<td>2.93±0.38</td>
<td>1.50±0.51</td>
<td>13.20</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Note:

- a Total score of After treatment: Treatment Group VS Control Group, t= -6.44, P=0.00
- b Melanin of After treatment: Treatment Group VS Control Group, t= -2.52, P=0.02
- c Height of After treatment: Treatment Group VS Control Group, t= -2.71, P=0.01
- d Vascularity of After treatment: Treatment Group VS Control Group, t= -2.12, P=0.04
- e Pliability of After treatment: Treatment Group VS Control Group, t= -2.42, P=0.02
Discussion –

We choose to use first the PDL to coagulate or close the scar’s blood vessels which gives these scars the red color and then use the fractional CO2 laser to prevent the scar’s continued growth as this laser deals primarily with inhibiting proliferating fibroblasts and the deposition of abnormal collagen.

The advantage of this combination approach is the definite clinical improvements that we see with the two technologies together. The disadvantage of this is that it takes several months to achieve these acceptable results.
A consensus within our plastic surgical team and in our clinical practice is that 3 months is the optimal scar duration for successful scar therapy.

As the thickness of a fresh immature scar is limited, the Deep Fx can be used to penetrate to deep layers of the scar tissue, produce the appropriate heat effect, and establish a drug delivery channel.
Conclusions –

In summary, the 595 nm adjustable pulse width PDL combined with the UltraPulse CO2 Fractional Laser appears to have a beneficial clinical effect on fresh red hypertrophic scars.

The PDL combined with the CO2 fractional laser treating fresh red hypertrophic scars is worthy treatment method, which should be used regularly in treating these fresh red hypertrophic scars.
What to Choose as After Surgical Procedures Care for Better Scar Outcome

Presented by Michael H. Gold, MD
Gold Skin Care Center,
Tennessee Clinical Research Center
Nashville, TN USA
Reduction of erythema from baseline assessment at each study visit

Figure 1. Reduction of erythema from baseline assessment at each study visit. Hemoglobin levels are presented as mean values ± standard error mean.
Patient preference of product properties at visit 3
Conclusions

Management choices should depend on the patient’s individual requirements and evidence-based findings.

There remains a significant need for further randomized, controlled trials of all available scar therapies and systematic, quantitative reviews of the literature to ensure optimal management of scarring.

Recommendations given are based on best available evidence to date.

2019 – we are able to treat hypertrophic scars and keloids better today than what has been available in the past.