contractures. The use of fat grafting in thermal injury has been previously reported only in small clinical series and results are often biased by simultaneous surgical procedures and lack of scientific methods of validation. 1–5

MATERIALS AND METHODS: Our study prospectively evaluates outcomes in 9 patients treated with the “SUFA” technique (Subcision and Fat Grafting) for debilitating contracted burn scars limiting range of motion. Results are evaluated clinically with the Vancouver scale and by range of motion through the affected joints at 1, 3, 6 and 12 months. Scientific validation of the outcomes is performed evaluating dermal thickening and scar remodeling by high definition ultrasound and histology examination with hematoxylin-eosin and monoclonal antibodies staining.

RESULTS: Results show clinical improvement, thickening of dermis and redistribution and reorientation of the collagen fibers within the dermis. Statistical significance (p<0.05) has been obtained for all analyzed data. Fat reabsorption occurred with a mean of 40%.

CONCLUSION: Our study gives scientific validation of the efficacy of subcision and fat grafting in contracted scar. New surgical and diagnostic techniques are illustrated. Our clinical and diagnostic outcomes suggest dermis regeneration secondary to the new fat grafting technique

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Improving Wound Healing Using α-gal: Antibody Stimulated Macrophage Directed Wound Healing

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INTRODUCTION: Macrophages are the crucial mediator of the wound healing response. Attracted by foreign bodies and inflammatory chemokines, they modulate the immune response and coordinate the transition to healing by the release of a variety of cytokines and growth factors. The α-gal epitope (Galα1-3Galβ1-4GlcNAc-R (α-gal) is abundantly synthesized on glycolipids and glycoproteins of non-primate mammals and New World monkeys by the glycosylation enzyme alpha1,3galactosyltransferase (alpha1,3GT)1. In humans, this epitope is absent because the α-1,3GT gene was inactivated in ancestral Old World primates1. Instead, humans produce the anti-Gal antibody (anti-gal), which specifically interacts with α-gal epitopes (primarily in the digestive tract) and which constitute approximately 1% of circulating immunoglobulins 2. We hypothesized that direct application of α-gal into wounds would be a safe and novel method to stimulate macrophages on a limited basis and thus promote wound healing.

MATERIALS AND METHODS: Because wild type mice naturally express α-gal and thus do not express anti-gal, we used α-1,3galactosyltrasferase knockout mice (α-1,3GT KO mice), which were stimulated to produce anti-gal at titers comparable to humans. Bilateral 6mm dorsal full-thickness splinted skin wounds were created and the mice were then treated with a one-time dose of α-gal nanoparticles directly into the wound. At post-op day 3, 6, and 9, two mice from each group were euthanized and the wounds were harvested for analysis.

RESULTS: On post-op day 3, mice treated with α-gal containing nanoparticles demonstrated an increased rate of keratinization (average keratinocyte migration of 225.7 μm versus 143.1 μm, a 57.7% increased rate of healing; p value .23) By 6 days post-op, mice treated with α-gal containing
nanoparticles demonstrated an even more significantly increased rate of keratinization (average keratinocyte migration of $2376 \mu m$ versus $986.4 \mu m$, a $141\%$ increased rate of healing $p$ value $0.0002$, with $3/4$ experimental wounds demonstrating complete re-epithelialization versus only $1/4$ controls). There were no systemic or local adverse effects seen in $\alpha$-gal treated mice. All wounds were healed in both groups by day 9.

CONCLUSION: One-time application $\alpha$-gal nanoparticles stimulated a significantly enhanced the wound healing response. This promising approach may be translated to human application, as a simple and natural means to enhance wound healing in both normal and pathologic conditions.

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Results of Keloid Treatment with Excision followed by Brachytherapy

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PURPOSE: Keloids are benign tumors of excessive scar tissue that can be painful, itching and cosmetically disturbing. Due to therapy resistance and recurrence treatment is challenging for patient and physician. Excision followed by brachytherapy has been successfully used to treat keloids, and is currently considered most effective in keloid treatment. Using brachytherapy, the dose of ionizing radiation should be as low as achievable while remaining effective, due to disadvantage side effects of radiation. This optimal fractionation scheme has not yet been determined. More information on results of specific schemes is needed.

MATERIALS AND METHODS: We retrospectively analyzed keloids treated with excision followed by 2 fractions of 9 Gy brachytherapy on the day of surgery from 2010 till June 2014 in the Erasmus University Medical Center Rotterdam, The Netherlands. Socio-demographics, keloid characteristics, complications, recurrences and additional treatments were collected; when data were missing chart review was supplemented by phone interviews.

RESULTS: We treated 87 keloids in 43 patients, 45% male, 9% fair skinned, 65% dark skinned, of whom 17% had one keloid, while 28% had over ten keloids. Keloids were caused by trauma (30%) and acne (29%). The ear (25%) was most affected, followed by the pre-sternal area (20%). Many caused pain (66%) and itch (79%). Complications after excision with brachytherapy were (partial) wound dehiscence (29%), infections (10%), chronic wounds (21%), grade 1 radiation dermatitis (25%) and severe pigmentation changes (26%). We found 3 full recurrences (3%), and 16 partial recurrences (18%) that rarely caused pain and caused fewer itches 27 (SD 15, range 1–58) months after surgery. Additional treatment with silicone sheets or corticosteroids was used in 25%; only two keloids were operated again after treatment.

CONCLUSIONS: We showed that excision followed by brachytherapy is effective as keloid treatment resulting in only 3% full and 18% partial recurrences, with significant reduction in pain and itch complaints. However, radiation had disadvantageous effects on wound healing causing high risk on hampered wound healing. Similar effectiveness was described for milder fractionation schemes, but complications were reported less frequently.2–4 In conclusion, although excision followed by 2 fractions of 9 Gy brachytherapy is effective for keloid treatment, a milder scheme might be preferred to reduce wound complications.

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