

Post Excision/Mohs Fractional CO2 Resurfacing:
A Quantitative and Qualitative Scar Analysis Study

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Statistical analyses

The scars were assessed 6 months after surgery. Each subject was asked if one scar half appeared cosmetically better than the other or if both halves looked cosmetically equivalent. A physician, blinded to treatment, then assessed each half of the scar according to the validated modified Manchester scar scale (MMSS).¹⁶

3mm punch biopsies were then extracted from each scar half and subjected to quantitative scar analysis. Biopsies were fixed in formalin then dehydrated, paraffin-embedded and breadloafed into sections for picrosirius red staining. For analysis of collagen architecture, confocal photographs were captured by a Leica[®] TCSSPMP confocal microscope (Leica Microsystems[®], Wetzlar, Germany) at 1000 fold magnification.¹⁷ Sections were scanned in 1 micron increments for the entire section thickness of 7 microns. Data of frame-mode images were recorded and stored as 512 pixel images. Fractal dimension (F_D) and lacunarity (L) analyses were performed on the confocal images using a previously described methodology.¹⁸

This method for quantitative scar analysis was chosen because confocal microscopy leverages the fluorescence properties of collagen and provides high resolution images of dermal structure. Scar tissue exhibits denser (higher F_D) and more homogenous (lower L) architecture compared with the looser, basket-weave pattern of normal skin. It, therefore, follows that cosmetically superior scar tissue should

closely resemble normal skin, with a lower F_D and higher L. Pairwise t-test comparison was performed using Stata[®] 12 software (StataCorp LLC, College Station, Texas).