

Scar Remodeling with the Association of Monopolar Capacitive Radiofrequency, Electric Stimulation, and Negative Pressure

Giovanni Nicoletti, MD, FEBOPRAS-3 Paola Perugini, PhD, Sara Bellino, MD, Priscilla Capra, PhD, Alberto Malovini, PhD, Omar Jaber, MD, Marco Tresoldi, MD, 1,3 and Angela Faga, MD, FICS1-3

Abstract

Objective: A study was established to objectively assess the effects of low-intensity electromagnetic and electric stimulation plus negative pressure on mature scars. **Background:** Radiofrequency plus negative pressure therapy demonstrated a favorable reorganization and regeneration of the collagen and elastic fibers and was proposed for the treatment of cellulitis and skin stretch marks. **Methods:** Twenty-six mature scars in 20 Caucasian patients (15 females and 5 males) were enrolled in the study. The treatments were carried out with a Class I, BF-type electromedical device equipped with a radiofrequency generator, an electric pulse generator, and a vacuum pump twice a week for 3 months. Corneometry, transepidermal water loss, elastometry, colorimetry, and three-dimensional skin surface pattern were objectively assessed with Multi Probe Adapter System MPA and PRIMOS pico. A subjective assessment was carried out with the VAS and PSAS scales. Each scar was compared before and after the treatment and with the skin in the corresponding healthy contralateral anatomical area at the same times. **Results:** Reduction of the scar surface wrinkling and overall scar flattening were demonstrated after the treatment. The scar slightly tended to approach the color and elasticity of healthy skin too. **Conclusions:** The combined local treatment of mature scars with low-intensity electromagnetic and electric stimulation in association with negative pressure might suggest a favorable synergic effect on the scar collagen and elastic fiber remodeling.

Keywords: scar, radiofrequency, negative pressure, electrical stimulation therapy

Introduction

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CAR FORMATION IS THE ultimate outcome of wound re-pair in

humans that takes place as a cascade consisting of overlapping inflammatory, proliferative, and remodeling phases.

When **the process of wound healing is uneventful after completion of the remodeling phase, the scar enters the so-called mature state according to the scheme proposed by the International Advisory Panel on Scar Management. Scar has no epidermal appendages and displays a collagen pattern of densely packed fibers. The tensile strength of**

wounded skin at best reaches only approximately that of unwounded skin.² In addition, **scar is brittle and less elastic than normal skin, although the regeneration of elastic fibers in the scar is still debated.**³ In addition, **scars are usually hypopigmented after full maturation even if they can become hyperpigmented in dark pigmented individuals or in lighter pigmented ones after exposure to UV radiation. In conclusion, the scar itself does not reproduce the features of normal skin, and therefore, it is still an unsolved functional and cosmetic issue despite the large number of treatment proposals: surgery, silicone gel sheeting, injected corticosteroids,**

1Plastic and Reconstructive Surgery, Department of Clinical Surgical Diagnostic and Pediatric Sciences, University of Pavia, Pavia, Italy.

Advanced Technologies for Regenerative Medicine and Inductive Surgery Research Center, University of Pavia, Pavia, Italy.

3Plastic and Reconstructive Surgery Unit, Istituti Clinici Scientifici Maugeri, Pavia, Italy.

4Department of Drug Sciences, University of Pavia, Pavia, Italy.

Laboratory of Informatics and Systems Engineering for Clinical Research, Istituti Clinici Scientifici Maugeri, Pavia, Italy. "Freelance Plastic Surgeon, San Martino Siccomario, Pavia, Italy.

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