LASERS

MECHANICAL MICRONEEDLING VERSUS ND YAG 1064NM FRACIONATED ABLATIVE LASER: A HISTOLOGIC STUDY IN HUMAN SKIN.

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Introduction: Mechanical Microneedling (MMn) use rollers with tiny needles to promote microcolumns of ablative injury for skin tightening. Alternatively, high fluences of Nd-Yag 1064nm can promote ablative microcolumns due to a LIOB (Laser induced optical breakdown) phenomenon, where multiphoton ionization contributes considerably to the generation of free electrons throughout the whole process of plasma formation. Few human histological studies prove and compare the clinical results.

Objective: Confirming and compare the histological changes with both techniques in the same patient at the same time and determining laser parameters that could be used to perform similar results.

Materials and Methods: A 58 years old white man, with laxity and abdominal "striae distensae", was submitted to a treatment with MMN and Nd Yag 1064nm, fractionated nanopulsed (LIOB), after informed consent was obtained.
Skin biopsies and clinical photos were done pretreatment and 20 minutes immediately after 1 laser pass at fluences of 50 mJ/px and 75mJ/px with 1.5Hz at FS20A handpiece (9x9px). Cold air was applied for pain control. Microneedling with 2,5 mm depth, crisscross technique, multiple passes; under tumescent anesthesia. Skin biopsy was performed and stained for HE, Picro-Sirus, Masson Trichomium and morphometry was performed with a Weibel reticulum.

Results: Histopathological analysis revealed that both methods preserve epidermis, maintaining an acceptable average of thickness (7.2 µm, 4.45 µm MMN and Nd Yag 1064nm). There was collagen rearrangement in both methods as well, with a transition to Collagen type III (Col I/Col III ratio of 16.2 in MMn vs 2.95), allowing for further type I collagenesis in skin healing.

Conclusions: Both methods can avoid epidermal destruction. Collagenic rearrangement occurs in both. The LIOB technique acted like a “laserneedling” process and can be accepted like tolerable and effective.