WHITE PAPER

DOT Therapy

CO_2 Fractional Laser: Objective Monitoring, over a 6-month Period, of Dermal Changes Induced by High-Resolution Ultrasound imaging and by Cutometer Measurements.

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CO_2 Fractional Laser: Objective Monitoring, over a 6-month Period, of Dermal Changes Induced by High-Resolution Ultrasound imaging and by Cutometer Measurements.

(Objective Assessment of Lasers in Aesthetic Dermatology 3)

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The introduction of CO_2 fractional lasers has significantly changed the dermatological treatment of photoaging and acne scars. However, this technique remains difficult to assess and its results can be perceived as inconsistent. Two preliminary cross-sectional studies have shown that the morphological and functional effects of the treatment can be measured through high resolution skin imaging and elasticity measurements. The purpose of this study is to ensure objective longitudinal monitoring of the treatment over a 6-month period.

An objective monitoring of the treatment was systematically proposed to patients treated with CO_2 fractional laser. The objective assessments were carried out before the treatment and 1, 3 and 6 months after the treatment.

The SmartXide DOT laser (DEKA, Florence, Italy) was used with the following parameters: 30W, 500µm, 1ms, spot 120µ, stack 1.

The high resolution ultrasound scanner used was the Dermcup Atys (Soucieux en Jarrest, France) with a 20 MHz frequency, which allowed measuring the dermal and subepidermal nonechogenic band (SENEB) thicknesses.

The cutometer (Courage and Khazaka, Germany) allowed for the automatic measurement of skin elasticity, viscosity, and fatigability parameters. The statistical analysis was appointed to the Clinical Investigation Centre in Tours.

This study has been validated by the CPP (Personal Protection Committee) of Angers.

24 patients were included in the study.

The dermal thickness increased consistently between the 1st and 6th month, except for the forehead. This increase was more significant between m0 and m1. The SENEB thickness had not changed, except for the forehead.

The increase in dermal thickness after six months had not significantly improved in patients who underwent 2 sessions, compared to those who underwent 1 alone, nor in those who underwent heavier postoperative periods. The best response was observed in younger and thinner skins, in certain areas (lips and chin), and in smokers.

The cutometric viscosity and fatigability parameters decreased consistently until the 6th month. After an initial increase during the 1st month, the elasticity parameters also decreased consistently.

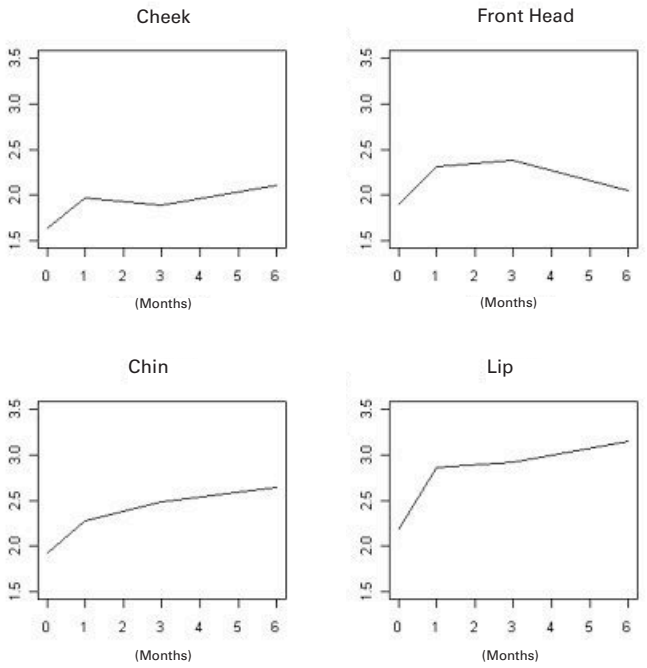


Figure 1. Average evolution of skin tickness

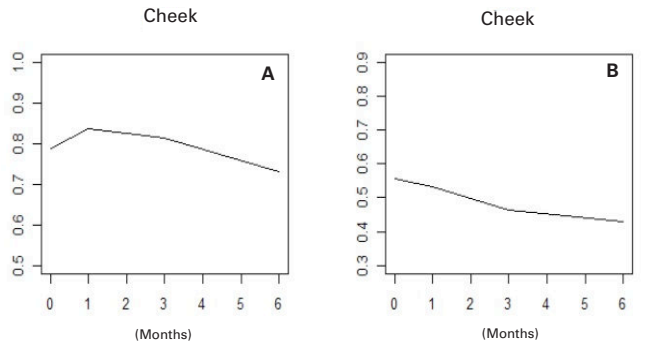
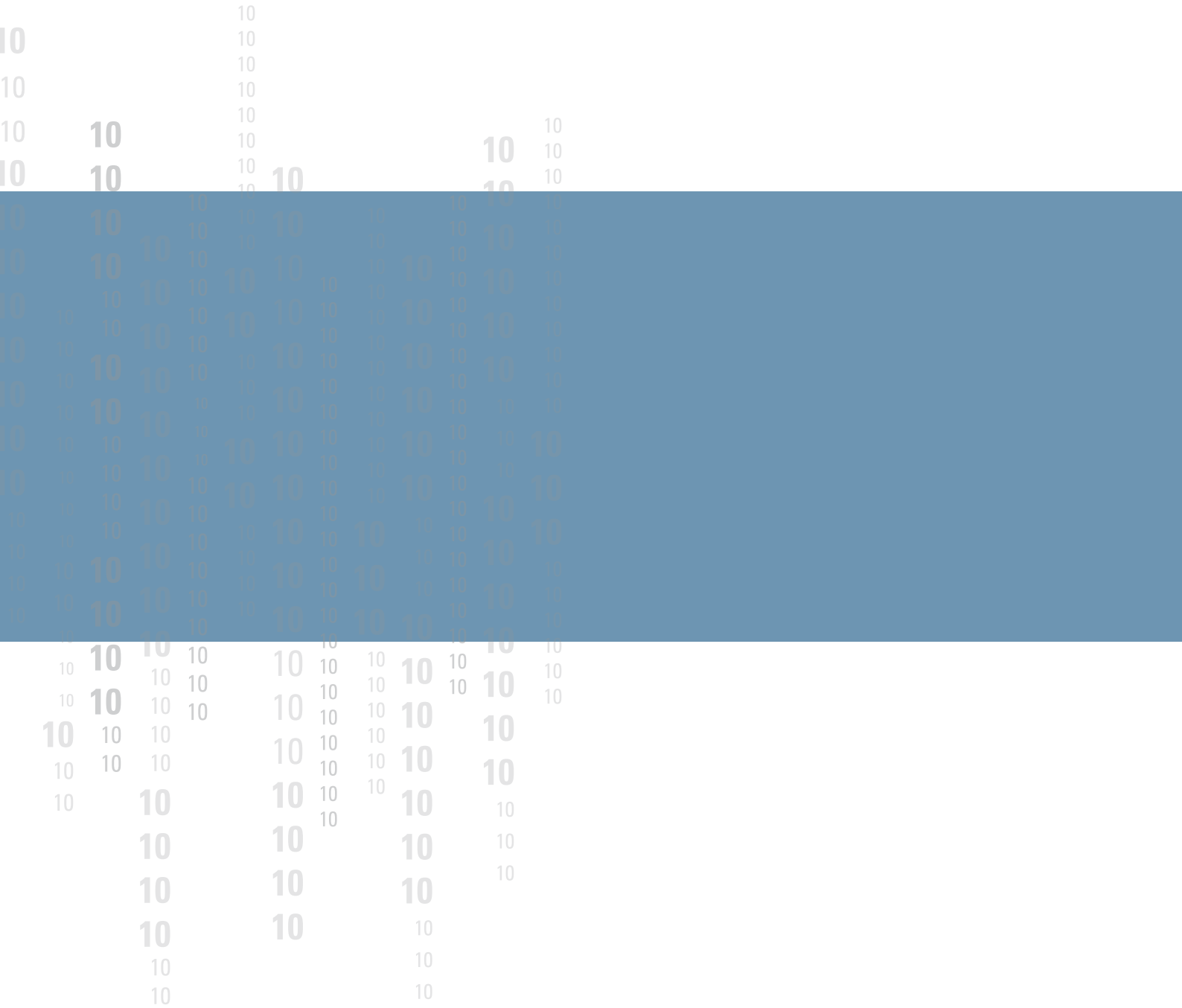


Figure 2. Average cutometric parameters of viscosity (**A**) and elasticity (**B**)

The effect of CO_2 fractional laser increased over a 6-month period. This is a fundamental difference compared to other aesthetic techniques, especially fillers and botulinum toxin, whose effects fade in the same period of time. After 6 months, our study confirmed the same factors predictive of response as the preliminary study after 3 months, to which two surprising elements are added: the positive effect of smoking and the absence of significant effects of a second treatment.

The cutometric analysis is also surprising: if the laser effect on the loss of viscosity and, therefore, the gain in firmness was expected, the loss of elasticity in the medium term was not. This loss can be explained by the profibrosing effects pertaining to ablative laser, allowing for an anchoring effect of the treated areas.



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