Minimally Ablative Resurfacing with the Confluent 2,790 nm Erbium:YSGG Laser: A Pilot Study on Safety and Efficacy

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**Background:** This study investigated the safety and efficacy of the confluent 2,790 nm Erbium:YSGG (Pearl™, Cutera) laser for facial rejuvenation. The 2,790 nm Er:YSGG wavelength has a lower water absorption coefficient than the 2,940 nm Er:YAG wavelength, allowing for minimally ablative resurfacing and coagulation, which may increase clinical efficacy while reducing patient downtime.

**Study:** Eleven subjects (mean age 50, skin types I-III) with mild to moderate photodamage and wrinkles had two facial treatments with the 2,790 nm Er:YSGG laser using a fluence of 3.5 J/cm², pulse duration of 0.4 ms, and 20% overlap. Treatments were performed 6 weeks apart. Pre-auricular biopsies from five subjects were evaluated at baseline and 6 weeks after final treatment. Data from blinded photo evaluations (four physicians using a quartile scale of improvement) and subjects’ self-assessment of improvement (none, mild, significant, dramatic) were analyzed.

**Results:** Histologically, 80% of subjects had new collagen formation in the dermal grenz zone, and 60% had increased epidermal thickness. Based on the blinded photo evaluations, 89% of subjects showed improvement in dyschromia, tone/texture, and fine lines; 55% showed improvement in wrinkles. Evaluators were substantially consistent (agreement between evaluators, kappa of 0.71) and accurate (agreement between evaluators versus gold standard, kappa of 0.78) in their identification of before and after photos. Subjects’ self assessment indicated “significant” to “dramatic” improvement in dyschromia (91% of subjects) and tone/texture (82%). All subjects saw “mild” to “significant” improvement in fine lines and wrinkles. No PIH or adverse events were reported. Moderate treatment discomfort was noted (mean pain score of 5.5/10).

**Conclusion:** The minimally ablative resurfacing treatments with the 2,790 nm Er:YSGG laser demonstrated good tolerability with minimal downtime. Blinded physician evaluations indicated visible improvement in the majority of subjects with strong agreement between evaluators. Subjects were highly satisfied with the improvement seen in dyschromia, tone/texture, fine lines and wrinkles.