

Comparison of Fractional Er:YAG and Carbon Dioxide Lasers in Resurfacing of Atrophic Scars in Asians

Woraphong Manuskiatti

Mahidol University, Faculty of Medicine, Department of Dermatology, Siriraj Hospital, Bangkok, Thailand

SUMMARY

Fractional erbium (Er:YAG) and carbon dioxide (CO₂) lasers are ablative fractional resurfacing systems widely used to improve the appearance of wrinkles and atrophic scars. However, there have been limited studies comparing the clinical outcome and adverse effects of these two lasers. We conducted a prospective, randomized trial to compare the efficacy and safety of fractional erbium and carbon dioxide lasers for the treatment of atrophic acne scars in individuals with skin phototype IV.

Twenty-four females with atrophic acne scars were randomly treated with a fractional Er:YAG laser on one side of their faces and a fractional CO₂ laser on the other side of their faces. All subjects received two treatments at two months interval. Subjects were evaluated using standardized photographs and a UVA-light video camera at baseline, and at 1, 3 and 6 weeks after the final treatment. The subjects were asked to rate their overall satisfaction at every follow-up visit. Side effects of treatment were recorded at every session.

Twenty subjects completed treatments and attended 1-, 3- and 6-month follow-up visits. At the 3 month follow up, 60% of the Er:YAG laser sites and 75% of the CO₂ laser sites were graded as having at least 25% to 50% improvement of scars. Improvement significantly progressed from the 1-month follow-up to the 3-month follow-up ($P < .001$). There was no statistically significant difference in clinical improvement comparing between two laser systems at 1- ($P = 0.90$), and 3-month ($P = 0.54$) follow-up visits. The percent reduction in scar volume corresponded to clinical evaluation. The mean pain score of CO₂ laser sites (6.2 ± 2.7) was significantly higher ($P = 0.001$) than that of Er:YAG laser sites (3.5 ± 1.7). Fractional Er:YAG laser sites (an incidence of 47.5%) were associated with higher incidence of pinpoint bleeding, compared with CO₂ laser sites (an incidence of 25.5%). Postinflammatory hyperpigmentation (PIH) was found with 35% of subjects on fractional Er:YAG laser sites and with 50% on fractional CO₂ laser site ($P = 0.52$). Mild and transient postinflammatory hyperpigmentation (PIH) was the most common adverse effect observed in 35% and 50% of the sites treated with Er:YAG and CO₂ lasers, respectively.

In summary, fractional Er:YAG and CO₂ lasers provided comparable outcome of scar treatment.

However, fractional CO₂ lasers were associated with a higher degree of discomfort during treatment and tended to create higher incidence of PIH.

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