

## Resurfacing of Pitted Facial Acne Scars Using Er:YAG Laser with Ablation and Coagulation Mode

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**Abstract.** Although the conventional, short-pulsed erbium:yttrium-aluminum-garnet (Er:YAG) laser provides substantial clinical improvement for pitted, facial acne scars, it shows less effective hemostasis and limited residual thermal effect in the dermis. Recently, dual-mode Er:YAG laser systems with both ablation and coagulation modes have been developed. The purpose of this study was to evaluate the clinical and histologic effects of resurfacing pitted, facial acne scars with a dual-mode Er:YAG laser. Twenty patients with pitted facial acne scars underwent laser resurfacing using a computerized-scanning, dual-mode Er:YAG laser. All patients had Fitzpatrick skin types ranging III–V. Initially, the epidermis was removed in two passes using the ablative settings. This step was followed by two passes in a mixed ablation and coagulation mode, to produce further ablation and controlled, residual thermal damage. A final pass in a ablation mode was used to remove necrotic tissue. Laser overlapping was approximately 30%. The results of laser treatment were evaluated for the degree of clinical improvement, duration of erythema, pigmentary change, and any adverse events at two weeks, one month, and three months. In two patients, skin biopsies were obtained at the following intervals: immediately and two weeks postoperatively for histologic examination. There was a 75% average clinical improvement observed in pitted, facial acne scars after laser treatment. Complete wound healing occurred between six and eight days. On histologic examination, complete re-epithelialization was observed at two weeks. Erythema occurred in all patients after laser treatment and lasted longer than three months in 10 patients (50%). Post-inflammatory hyperpigmentation occurred in 12 patients (60%) two to four weeks after laser treatment and lasted longer than three months in one patient (5%). One patient

(5%) experienced mild hypopigmentation. Mild to moderate, postoperative acne flare-up occurred in seven patients (35%). No other adverse effects were observed. In conclusion, resurfacing with a dual-mode Er:YAG laser is a safe and effective treatment modality for pitted, facial acne scars.

**Key words:** Acne scar—Dual-mode Er:YAG laser—Laser resurfacing

Laser resurfacing is a popular treatment modality to improve pitted, facial acne scarring [8]. The two modalities that have emerged as the most popular are the CO<sub>2</sub> and, more recently, the Er:YAG laser [13]. The Er:YAG laser, with a 2940-nm wavelength, is highly absorbed by water, so it is almost totally absorbed by a very thin, superficial layer of skin and can be used for precise and superficial tissue ablation [9,14,15]. Although Er:YAG laser has the advantages of quicker healing, lower degree of erythema, and less postoperative morbidity, the long-term results in facial rejuvenation have been disappointing [13]. Also, intra-operative hemostasis is difficult to achieve [7]. These effects are believed to be due to the much smaller band of residual thermal damage (RTD) left in the dermal tissue following Er:YAG ablation compared with the deeper band of RTD created by the CO<sub>2</sub> laser [13]. A variety of newer laser systems have attempted to combine the precise ablation of a short-pulsed Er:YAG laser with some of the controlled thermal effects seen with CO<sub>2</sub> laser [12]. One of these systems is the dual-mode Er:YAG laser which has two Er:YAG laser heads that provide both short-pulse, ablative and long-pulse, sub-ablative coagulative components [16]. The purpose of this study was to evaluate the clinical and histologic effects of resurfacing pitted, facial acne scars with a dual-mode Er:YAG laser.