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Laser resurfacing with a long pulse erbium: YAG laser compared to the 950 ms pulsed CO_2 laser

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Abstract

Background and Objective:
Laser resurfacing with the 950 μs pulsed CO_2 laser is an effective treatment for photodamage and acne scarring; however, the potential for prolonged erythema and delayed re-epithelialization dissuade many patients from the procedure. With the use of erbium lasers alone, there is a decrease in the incidence and severity of these adverse sequelae; however, it is difficult to achieve the same degree of improvement as with the CO_2 laser because of the more superficial depth of resurfacing. Thus, new erbium lasers have been developed with longer pulse durations to deliver increased thermal effects to tissue. It is hypothesized that with the use of these lasers, diminished erythema and faster wound healing will be observed as well as enhanced clinical outcomes.

Study Design/Materials and Methods:
Sixteen patients were randomized to receive laser resurfacing on one-half of the face with the 950 μs pulsed CO_2 laser ($UPCO_2$) followed by short pulse erbium:YAG ablation, and to the other half with a variable pulsed erbium laser (VP Er:YAG) followed by traditional short pulse erbium laser. Patients were evaluated clinically before resurfacing and at 1, 2, 4, 8, and 12 weeks post-operatively. Histologic samples taken at various time periods before and after resurfacing were also evaluated.

Results:
Overall clinical improvement was equal for both $UPCO_2$ and VP Er:YAG treated sides with an average improvement in photoaging scores of 57%. Decreased erythema, less edema, and faster healing were observed on the VP Er:YAG treated side.

Conclusion:
The VP Er:YAG laser can achieve a similar degree of improvement as seen with short pulse CO_2 laser resurfacing with decreased thermal tissue effects and decreased risk for adverse sequelae. Lasers Surg. Med. 29:136-141, 2001. © 2001 Wiley-Liss, Inc.

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