

### Treatment of Active Acne and Acne Scars With a Single Laser Modality, Using a Novel 650-microsecond Pulsed Nd: YAG 1064nm Laser

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#### Abstract

This study was conducted to evaluate the use of a single laser modality to treat two skin conditions simultaneously: clearance of active acne, and reduction of acne scars. A novel Nd: YAG 1064nm laser with 650 microsecond pulse duration and a peak power of more than 15,000 watts per pulse was used. 10 subjects with skin type I-IV and an average age of 30 – 5 males and 5 females – were enrolled for the series of 3 treatments 2-3 weeks apart. The laser treatment was well tolerated with no anesthesia or any form of skin cooling. No complications were observed; subjects reported little or no treatment discomfort and a pleasant warming sensation as a result of the laser treatment. Of the 10 subjects, 8 rated their satisfaction as High and 2 rated it as Very High.

#### Background and Objective

Active acne and acne scars are among the most cosmetically troubling skin conditions. These conditions often occur simultaneously since acne naturally leads to scarring. Lasers that target hemoglobin have been shown to promote the clearance of active acne by superheating the vasculature in and around the sebaceous glands, and destroying *p. acnes* bacteria; meanwhile it is also known that lasers that have an affinity to absorption of water in the skin tissue can stimulate the formation of new collagen in the dermis, thereby reducing the severity of acne scars. Separate laser or non-laser modalities are typically used to perform these two treatments independently. The purpose of this study was to evaluate an Nd: YAG 1064nm laser (the LightPod Neo from Aerolase Corporation, Tarrytown, NY) in terms of its ability to treat both active acne and acne scars. In addition to having the affinity for both hemoglobin and water that is inherent

in the 1064nm wavelength, this laser offers a unique 650µsec pulse duration and a peak power of more than 15,000 watts per pulse, which theoretically should provide high efficacy in terms of *p. acnes* destruction as well as collagen stimulation, due to the high power per pulse.laser treatment.

#### Study Design/Materials and Methods

10 subjects with skin type I-IV and an average age of 30– 5 males and 5 females – were enrolled for the series of 3 treatments each. Treatment sessions, which were spaced 2-3 weeks apart, targeted active acne lesions and acne scars in the upper and lower facial areas. No other topical, oral or light-based therapies were combined in the treatment regimen. All subjects confirmed that they were not using Accutane or other photosensitizing medications, and were not pregnant; none were using oral or topical antibiotics for the acne. Subjects had all makeup and lotions removed immediately prior to treatment. In the first treatment session, laser treatment was performed as follows: (a) one pass across all entire affected areas at fluences of 21-24 joules/cm<sup>2</sup> on a 6mm spot size, in a painting motion to cover the treatment sites, in order to preheat the vasculature around the sebaceous glands and also to stimulate deep dermal collagen remodeling; and (b) a single pulse applied to each active acne lesion, at a fluence of 223 joules/cm<sup>2</sup> on a 2mm spot size, to further superheat and destroy *p. acnes* bacteria.

At the second treatment session, significant reduction of active acne lesions was already evident, so the skin was already less sensitive and thus the subjects could easily tolerate a microdermabrasion treatment prior to laser treatment (this removes the stratum corneum and thereby enhances depth of penetration of laser energy); otherwise, laser treatment was performed at the same parameters as the first treatment. In the third treatment session, the protocol was identical to the first session. All treatments were performed using a 1064nm Nd: YAG laser, LightPod Neo (Aerolase, Tarrytown, NY) with a novel 650 microsecond pulse duration. No anesthetics, cooling, or gels were used regardless of skin type, as the laser does not require any numbing or skin cooling. After each treatment session, patients were provided with moisturizer for sensitive skin and advised to use sun block with SPF 15. All subjects were asked to rate their satisfaction with the procedure after the treatment, on a scale of Low, Moderate, High or Very High.

### Results

The laser treatment was well tolerated without any anesthesia or any form of skin cooling; subjects reported little or no treatment discomfort and a pleasant warming sensation as a result of this treatment. No complications were observed. In a few instances the acne lesion erupted as a result of the application of laser energy. Transient erythema was occasionally noted but it resolved within 1 to 4 hours. The combined effect of the acne clearance and the reduction or elimination of the acne scars produced improvement in terms of overall skin condition and appearance on all subjects. reduction or elimination of the acne scars produced improvement in terms of overall skin condition and appearance on all subjects. The laser treatment achieved clearance of more than 90% the acne on average, and more than 50% reduction of the acne scars on average; of the 10 subjects, 2 rated their satisfaction as High and 2 rated it as Very High.

### Conclusion

This study shows that a single modality – specifically, a 650 microsecond pulsed Nd: YAG 1064nm laser generating 15,000 watts per pulse – can be used to simultaneously treat active acne and acne scars, providing profound clearance of both conditions after a series of three treatments. The treatments can be performed safely and effectively without use of any type of anesthesia or cooling. Side effects and complications were not observed during this study.

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All cases pictured are before and after 3 treatments.

