

Clinical Case Report on Treatment of Acne Vulgaris With 532nm KTP Laser

KTP Subject 06

Leyda Elizabeth Bowes, M.D., Department of Dermatology,
Harvard Medical School, Wellman Laboratories of Photomedicine, Boston, MA

Introduction

The patient is a 20-year-old woman who has had acne vulgaris on her face for several years. Both sides of the face were affected with moderate inflammatory acne, consisting of inflammatory comedones, papules, pustules and nodules. She had received oral antibiotics and topical retinoids in the past without resolution of her acne. The patient stopped all treatments for at least eight weeks prior to receiving the laser exposure. She did not have any major illnesses or a history of keloid formation.

Treatment Parameters

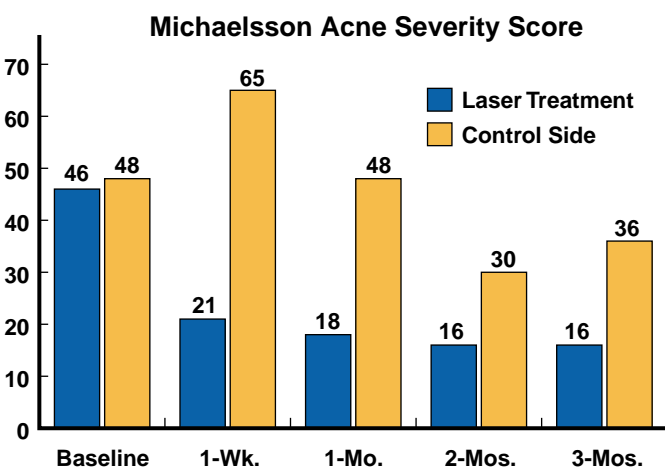
Test spot laser exposures with the 532 nm KTP laser (Aura, Laserscope, San Jose, CA) were performed in the preauricular area to determine safe and comfortable parameters for facial exposure. Treatment exposures were given to one randomly chosen half of the face, twice weekly for two weeks totaling four treatments. Treatment parameters included a fluence of 7 to 9 J/cm², 10-msec pulse, 4-mm spot size, 5 Hz repetition rate, and contact cooling through a chilled sapphire window. Laser exposure was done using a paintbrush technique, performing several passes over the entire half of the face with care taken not to stack pulses, and reaching a cumulative fluence of 40-50 J/cm². The contra lateral control side received contact cooling only and no laser exposure during each session.

Clinical evaluation of acne activity was done using the Michaelsson acne severity score. This score counts



the number of each type of lesion (comedones, papules, pustules, nodules), multiplies each number by the severity index for that particular acne lesion (comedone=0.5, papule=1, pustule=2, nodule=3), and adds up all the multiples. The resultant number is the acne severity score.

The effects of laser exposure on sebaceous glands were studied by performing sebum measurements and Sebutape™ analysis. The Sebumeter (Sebumeter SM 820, Courage & Khazaka, Germany) is an electronic device that measures the sebum content of the skin surface in a noninvasive way. The Sebutape is a more dynamic measure or estimate of sebaceous gland activity. It is a translucent film that is brought in contact with the skin for 30 minutes, after cleansing the skin with isopropyl alcohol. The sebum generates localized changes in the optical properties of the film. The changes can be correlated to sebaceous gland activity using a calibrated comparison chart.



Lastly, digital fluorescence photography of porphyrins produced by *Propionibacterium acnes* was also done. Bright orange-red fluorescent dots are seen with this method corresponding to hair follicles populated with *P. acnes*. Intensity of this fluorescence pattern is also correlated to degree of bacterial population in the hair follicle.

Outcome

Evaluation of acne and sebaceous gland activity was done at baseline, and at 1-week, 1-month, 2-months and 3-months after 532 nm KTP laser treatment. On the side receiving laser treatment, the acne severity score was 46 at baseline, and decreased to 21 at 1-week, 18 at 1-month, and 16 at 2-months and 3-months after laser exposure. On the control side, the acne severity score was 48 at baseline, and increased to 65 at 1-week, and later on decreased gradually to 48 at 1-month, 30 at 2-months and 36 at 3-months after laser exposure. These values did not differ significantly from the score at baseline.



The sebum measurement on the laser-exposed side was 21 at baseline, and decreased to 9 at 1-week, and then gradually increased to 21 at 1-month, 20 at 2-months and 19 at 3-months after laser exposure. Overall, after an initial reduction of sebum content on the laser-exposed side at 1-week, these measurements normalized and approached baseline levels at each subsequent follow-up. On the control side, the sebum measurement was 22 at baseline, and increased to 31 at 1-week, 29 at 1-month, 37 at 2-months and then decreased to 13 at 3-months after laser exposure. The area of sebum production collected from the Sebutapes, showed a modest decrease in sebum output on the laser-exposed side. This was more apparent in the early follow-up period as well, similar to the pattern in sebum measurement changes.

Orange-red fluorescent dots on the medial cheeks decreased in number immediately after laser exposure. This reduction was maintained at the 1-week follow-up, and to a lesser degree at the 4-week follow-up. No change in fluorescence, compared to baseline, was seen at the 8-week and 12-week follow-ups, on the laser-treated side. No significant change in fluorescence photography was noted on the control side.

Side effects after laser exposure included mild to moderate redness and swelling. There were no permanent sequelae.

Patient satisfaction with treatment outcome on the laser-exposed side was ranked as high at all follow-up time points. The patient noted faster healing of existing acne lesions after laser exposure, as well as a reduction in the frequency and severity of new acne breakouts.

References

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