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# Sebaceous Hyperplasia Treated With a 1450-nm Diode Laser

DAVID NO, MD, PhD,<sup>\*†</sup> MARLA MCCLAREN, MD,<sup>\*</sup> VERA CHOTZEN, MD,<sup>\*</sup> AND SUZANNE L. KILMER, MD<sup>\*</sup>

*Laser & Skin Surgery Center of Northern California, \*Sacramento and †Folsom, California*

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**BACKGROUND.** Sebaceous hyperplasia is a benign proliferation of the sebaceous gland. Previous treatment options have included isotretinoin, destructive modalities, and pulsed-dye laser.

**OBJECTIVE.** To evaluate the efficacy of a 1450-nm diode laser for the treatment of sebaceous hyperplasia.

**METHODS.** Ten patients with sebaceous hyperplasia were treated one to five times with a 1450-nm diode laser. Fluences of 16 to 17 J/cm<sup>2</sup> were used, with cooling durations of 40 to 50 ms. Patients and physicians evaluated treated lesions for

improvement. Measured areas of treated lesions were also recorded.

**RESULTS.** In most cases, patients and physicians rated improvement as "very good" or better. After two to three treatments, 84% of lesions shrunk greater than 50%, and 70% shrunk greater than 75%. Adverse effects were unusual; one atrophic scar and one case of transient hyperpigmentation were observed.

**CONCLUSION.** The 1450-nm diode laser is effective and safe for the treatment of sebaceous hyperplasia.

*D. NO, MD, PHD, M. MCCLAREN, MD, V. CHOTZEN, MD, AND S. L. KILMER, MD HAVE INDICATED NO SIGNIFICANT INTEREST WITH COMMERCIAL SUPPORTERS.*

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A COMMON and benign proliferation of the sebaceous gland, sebaceous hyperplasias, is often treated for their unwanted yellow and papular appearance. Previous treatments include isotretinoin,<sup>1,2</sup> bichloroacetic acid,<sup>3</sup> cryosurgery,<sup>4</sup> electrodesiccation,<sup>5</sup> argon laser,<sup>6</sup> pulsed-dye laser,<sup>7</sup> and CO<sub>2</sub> laser.<sup>8</sup> In this study, we explored the use of a 1450-nm diode laser for the treatment of sebaceous hyperplasia. With water as its target, this laser generates a zone of heat in the dermis from 100 to 600 μm deep. Its current indications are periorbital wrinkles and back acne.<sup>9</sup> Its efficacy for acne suggests that dermal heating may abrogate normal sebaceous gland function. As an extension of this notion, we explored the efficacy of a 1450-nm diode laser for sebaceous hyperplasia.

## Methods

Informed consents were obtained from all patients. All patients were photographed before every treatment and after the last treatment. For patients 8 through 10, individual lesions were measured before the onset of treatments and 4 weeks after the last treatment.

For all patients, a 1450-nm diode laser (Smooth-Beam; Candela, Wayland, MA) was used. Using a 4-mm spot size, a fluence of 16 to 17 J/cm<sup>2</sup> was

delivered. Cryogen cooling was set at 40 to 50 ms. At 16 J/cm<sup>2</sup> of fluence and 40 ms of cooling, the following is the sequence of laser events: 10 ms of cooling, 5-ms delay, 52.5-ms lasing, 7 ms of cooling, 5-ms delay, 52.5-ms cooling, 7 ms of cooling, 5-ms delay, 52.5-ms cooling, 7 ms of cooling, 5-ms delay, 52.5 ms of cooling, and finally, 10 ms of cooling. Hence, there is a total of 41 ms of cooling and 210 ms of lasing. Most lesions were treated with a single pulse, except for thicker lesions, which were treated with two pulses. Larger lesions (more than 5 mm in diameter) required additional single pulses to treat the entire lesional area. A total of one to five treatments, spaced 4 to 6 weeks apart, were performed on each patient. Patients were advised to apply bacitracin ointment twice daily until healing was complete (i.e., 5 to 7 days).

Patients and investigators rated overall improvement of treated lesions on a 0 to 4 scale: 0 = 0% (none), 1 = 1% to 25% (moderate), 2 = 26% to 50% (good), 3 = 51% to 75% (very good), and 4 = 76% to 100% (excellent). For patients 8 through 10, lesions were measured before the first treatment and after the last treatment. Areas were calculated to determine the extent of reduction.

## Results

Ten patients, with greater than 330 discreet lesions, were treated using a 1450-nm diode laser. A total of one to five treatments (average of 2.2) were performed.

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Address correspondence and reprint requests to: Suzanne L. Kilmer, MD, Laser and Skin Surgery Center of Northern California, 3835 J Street, Sacramento, CA 95816.

**Improvement**

All 10 patients noted improvement (Figure 1). Half of the patients rated their improvement as “excellent” (Table 1). The average patient and physician improvement scores were 3.1 (“very good”) and 3.5 (“very good”), respectively. Patients and investigators noted shrinkage of height, bulk, and diameter.

**Individual Lesion Improvement**

For patients 8 through 10, individual lesions were measured, and areas were calculated before the first treatment and after the last treatment (Table 2). Of the 57 lesions treated, 56 lesions decreased in area after a total of two to three treatments; 49 of 57 (86%) shrank by at least half.

**Treatment and Posttreatment Observations**

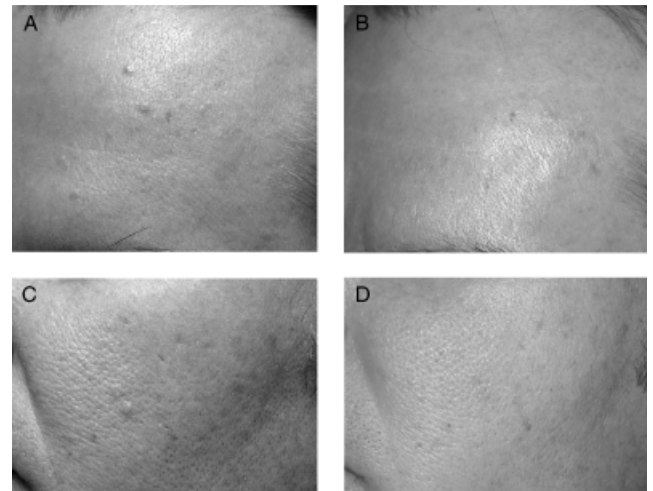
Individual lesions typically whitened immediately after treatment. This “whitening” lasted from 2 to 10 seconds. Treatment was associated with mild to moderate pain that subsided immediately afterward. No blistering was seen. After treatment, many lesions became crusted, often extruding oily fluid 1 to 3 days after treatment. Lesions typically healed by days 2 to 7. A reduction in size was complete by 2 weeks after each treatment.

**Side Effects**

After the acute healing period, side effects were unusual in these 10 patients. An atrophic scar was seen 6 weeks after the treatment of patient 3. The atrophy eventually improved months later. Transient hyperpigmentation was observed in a few treatment areas in patient 4, which subsequently resolved with bleaching agents.

**Discussion**

In this report, we demonstrate that sebaceous hyperplasias can effectively be treated by a 1450-nm diode



**Figure 1.** Improvement of sebaceous hyperplasia. Representative lesions from patient 10 were photographed before and after the treatment course (three treatments). Note the near complete resolution of lesions on the forehead (A and B). Complete clearance of a solitary cheek lesion is also shown (C and D).

**Table 1. Summary of Overall Improvement**

Patient Number	Lesions	Treatments	Patient Score	Physician Score	Side Effects
1	14	2	3	3	None
2	1	1	1	1	None
3	11	1	4	3	Atrophic scar
4	>200	5	4	4	Hyperpigmentation
5	12	2	4	4	None
6	14	2	4	4	None
7	23	2	2	3	None
8	9	2	3	3	None
9	13	2	2	3	None
10	35	3	4	4	None

laser. Requiring one to three treatments typically, this treatment can effectively reduce the size of lesions with good tolerability and limited healing periods. With only one scar in over 300 lesions treated, this treatment is safe and reliable.

The mechanism for this treatment is unknown. At 1450 nm, the laser primarily targets water, hence

**Table 2. Improvement of Individual Lesions**

	None (0%)	Poor (1% to 25%)	Good (26% to 50%)	Very Good (51% to 75%)	Excellent (76% to 95%)	Clear (>95%)
Patient 8 (9 lesions, 2 treatments)	1	1	1	3	2	1
Patient 9 (13 lesions, 2 treatments)	0	1	2	2	4	4
Patient 10 (35 lesions, 3 treatments)	0	0	3	3	19	10

For patients 8 through 10, lesions were counted and measured before treatment onset and after the last treatment. Calculated area reductions are outlined here. Sizes and photographs were compared with measure reduction of lesion size. Patient and physician scores represent the following improvement: 0 = 0% (none); 1 = 1% to 25% (moderate); 2 = 26% to 50% (good); 3 = 51% to 75% (very good); 4 = 76% to 100% (excellent). Scores were taken after the last treatment.

generating heat within a zone of the dermis. The most likely mechanism is heat-induced destruction of sebaceous glands. This finding is consistent with the mechanism by which this laser improves acne.

Beyond the amelioration of these frustrating lesions, this treatment demonstrates a novel use for this infrared laser currently indicated for periorbital rhytids and acne. With larger lesions, our current clinical practice is to double pulse and increase the fluence to 18 J/cm<sup>2</sup> to improve efficacy. Further studies are needed to reveal long-term efficacy and recurrence rates.

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