532-nm Diode Laser Treatment of Seborrheic Keratoses with Color Enhancement

GARY RANDALL CULBERTSON, MD, FACS*

BACKGROUND Seborrheic keratoses (SKs) are benign cutaneous tumors of the epidermis. Localization in the head and neck areas can produce an unsightly appearance. Recurrence after curettage, shave excision, cryoablation, or chemical peel can be common.

OBJECTIVE The objective was to determine if laser ablation with the 532-nm laser and color enhancement is effective in removing SKs.

MATERIALS AND METHODS A total of 326 patients who presented with 1,567 benign SKs were treated with the DioLite (Iridex Corp.) and VersaPulse cosmetic (Coherent Inc.) 532-nm diode lasers with color enhancement using a red marker or ferric subsulfate. The DioLite was set at 27 to 30 J with a 2- to 3-mm spot size, and a 10-ms pulse width was used for ablation. The VersaPulse was set at a lower energy of 9.5 to 12 J/cm² with a 3-mm spot size, 3- to 6-Hz repetition rate, and 10-ms pulse duration for ablation. All patients were Caucasian.

RESULTS Complete resolution of the SKs occurred in 93% of lesions. Seven percent of SKs required a second round of laser treatment for incomplete ablation. There were no cases of hyperpigmentation or hypertrophic scar formation of the skin following laser treatment. Hypopigmentation occurred in 6% of patients and was associated with old, chronic, or recalcitrant lesions.

The author has indicated no significant interest with commercial supporters.

S eborrheic keratoses (SKs) are benign cutaneous tumors of the epidermis. The tumors enlarge with age and often become deeply pigmented.¹,² Localization in the head and neck areas can produce an unsightly appearance. Their etiology is unknown. Chronic sun exposure or painful sunburns are not associated with these skin lesions.³ SKs can be confused or be present with other cutaneous malignancies such as basal cell carcinoma, squamous cell carcinoma, or malignant melanoma. They are unreliable as cutaneous markers for internal cancer.⁴ Recurrence after curettage, shave excision, cryoablation, or chemical peel can be common. Treatment by various laser modalities including the CO₂, erbium, argon, 492-nm, 510-nm, and alexandrite lasers have been documented.⁵–¹¹ A 532-nm diode laser treatment is a well-established option for the management of SKs. Those that lack significant pigment can fail laser treatment.¹²

Materials and Methods

A total of 507 patients were treated with the 532-nm lasers and color enhancement. Only 65% of patients (326) had follow-up to 6 months postprocedure. These 326 patients presented with 1,567 benign SKs. Items used to perform the procedure are shown in Figure 1. Topical or local anesthesia was administered prior to each procedure. The cutaneous lesion was first marked/colored with a red marker. SKs were treated with the DioLite (Iridex Corp., Mountain View, CA) or VersaPulse cosmetic (Lumenis, Santa Clara, CA) 532-nm diode lasers after color enhancement with a red marker. The DioLite was set at 27 to 30 J/cm² with a 2- to 3-mm spot size and 10-ms pulse duration for ablation. The VersaPulse was selected to the variable pulse green 532 nm, set at a lower energy of 9.5 to 12 J/cm² with a 3-mm spot size, 3- to 6-Hz repetition rate, and 10-ms pulse duration for ablation. Each SK was treated to effect

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Results

SKs varied in size from 0.5 to 8.25 cm. The mean number of lesions treated per patient was 6. The total number of patients was 326 with 1,567 benign SKs treated with the 532-nm diode lasers. All patients were Caucasian. Phototypes were 2% Type 1, 6% Type 2, and 92% Type 3. No Asian, African-American, or Latin-American patients were included in the study group. The vast majority (>86%) of SKs treated were in the head and neck region. Complete resolution occurred in 93% of lesions. Seven percent of SKs required a second round of laser treatment for incomplete ablation. There were no cases of hyperpigmentation, ferric tattooing, or hypertrophic scar formation of the skin following laser treatment. Hypopigmentation occurred in 6% of patients and was associated with old, chronic, or recalcitrant lesions. All cases of hypopigmentation occurred in Phototype 3 patients. Any lesion that failed to respond to ablation was biopsied (<1%). No cases of malignancy were identified in these patients (Table 1). Long-term recurrence (>6 months) of the treated SKs was unusual (<1%) and may have represented an untreated area. A common client is shown in Figure 2.

Conclusion

Using the 532-nm diode laser and color enhancement (by coloring the cutaneous lesion with a red marker) for ablation of the SKs is simple and results in successful long-term ablation of SKs in the vast majority of patients with few ill effects. The topical application of red marker pigment or ferric subsulfate appears to capture the intensity of the 532-nm diode laser, assisting in the ablation of the SK. Care should be taken with old, chronic, or recalcitrant

<table>
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<tr>
<th>TABLE 1. 532-nm Laser Treatment Group</th>
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<tr>
<td>Patients Treated (6-Month Follow-up)</td>
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Figure 1. Supplies used for laser ablation of SKs: 4 × 4-in. gauze, local anesthetic, topical anesthetic, ferric subsulfate, red marker, and cotton-tipped swabs.
SKs to caution patients that ablation may result in some areas of hypopigmentation. In the majority of patients, one laser session was required for complete removal of their SKs. Further studies should be performed comparing the outcome of this procedure with and without color enhancement to find out if it is beneficial to apply the more complicated version of this treatment option of SK.

References


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Figure 2. Preprocedure (top) and 3 months postprocedure (bottom) photographs of a 68-year-old white female with severe SKs of the forehead/right temple region. Patient underwent one session of laser ablation with the DioLite (Iridex Corp.) 532-nm laser at 28 J/cm² with a 3-mm spot size and 10-ms pulse duration with color enhancement under local anesthesia.

COMMENTARY

According to our experience 532-nm diode laser treatment is a well-established option for the management of seborrheic keratoses (SKs). We usually perform it without local anesthesia and without color enhancement of the lesions. Laser light transforms to heat and coagulates the epidermal proliferation present as SK in an
This approach does not require any wound care because no wound is created. No antibiotic treatment is needed. The lesions transform to dry crusts and fall off after 5 to 7 days.

Further studies should be performed comparing the outcome of the procedure with and without color enhancement to determine if it is beneficial to apply the more complicated version of this treatment option of SK.

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