RESEARCH LETTERS

755-nm Alexandrite Laser for the Treatment of Non-Facial Superficial and Nodular Basal Cell Carcinoma

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ABSTRACT

Background: There is emerging literature regarding laser therapy as a treatment for non-melanoma skin cancer, with reports of vascular selective lasers and ablative lasers showing promise in basal cell carcinoma (BCC).

Objectives: To assess the efficacy of the 755-nm laser in the treatment of non-facial BCC of the superficial and nodular subtypes. To provide patients with a non-surgical option for the treatment of BCC.

Methods: Nineteen veterans, each with at least one biopsy proven superficial or nodular BCC on the trunk or extremity, agreed to participate in our IRB-approved, prospective, non-randomized, open-label clinical trial. A total of 21 BCC were treated, after local anesthetization, using the 755-nm Alexandrite laser (Gentle-Lase, Candela Corporation) in a single session with a 4 mm margin. Treatment sites were re-biopsied approximately six weeks later.

Results: Twenty-one of 21 treated BCC demonstrated complete histologic tumor resolution at 6-week follow-up. At six weeks, all patients had a scar, and some patients had associated crusting, scaling or ulceration. The high energy and absence of dynamic cooling in our study likely resulted in additional thermal damage to the tumors. Healing times and scar appearance were comparable to electrodesiccation and curettage sites.

Limitations: Our study was limited by a small sample size, lack of a control group, and sampling of treatment sites with shave removal rather than complete excision.

Conclusion: The 755-nm laser has vessel-selective properties and a greater depth of penetration compared to vascular selective lasers. Our study results suggest that the 755-nm Alexandrite laser may be an effective treatment for superficial and nodular BCC on the trunk and extremities. Further investigation is warranted.

INTRODUCTION

Laser therapy has a wide variety of clinical applications in dermatology. There is emerging literature regarding laser therapy as a treatment for non-melanoma skin cancer, particularly for patients who are not surgical candidates. The greatest promise has been shown in the treatment of basal cell carcinoma (BCC) with vascular and ablative lasers.[1] In 2011, Ibrahimi et al.

described success in treating multiple basal cell carcinomas in a single patient with Basal Cell Nevus syndrome using the 755-nm Alexandrite laser.[2] No subsequent studies, to our knowledge, have further investigated the 755-nm laser in the treatment of BCC.

METHODS

We designed a prospective, non-randomized, open-label clinical trial to further assess the efficacy of the 755-nm Alexandrite laser in the treatment of non-facial BCC of the superficial and nodular subtypes. The study was approved by the Institutional Review Board at the South Texas Veterans Health Care System. Nineteen veterans, each with at least one biopsy-proven superficial or nodular BCC on the trunk or extremity, agreed to participate in our study. Exclusion criteria included tattoos overlying the affected or adjacent skin, photosensitivity, medications in which infrared light is a contraindication, pregnancy, light-induced seizure disorder, active infection of the treatment area, or if the treatment area was overlying an implantable cardiac device. A total of 21 BCC were treated. Following local anesthetization with intralesional 1% lidocaine without epinephrine, the tumor site and a 4-millimeter margin of clinically normal-appearing surrounding tissue were treated in a single session using the 755-nm Alexandrite laser (Gentle-Lase, Candela Corporation). The following settings, identical to the settings used in the initial report by Ibrahimi et al., were utilized: 8 millimeter spot size, two passes at an energy of 100 J/cm2, pulse length of 3 milliseconds, no dynamic cooling mode, and 10% overlapping of treated tissue between pulses. Treatment resulted in an eschar in all cases. Post-laser wound care involved petrolatum jelly and a non-stick dressing. The treatment sites were then re-biopsied using a broad shave technique approximately six weeks later.

RESULTS

Twenty-one of 21 treated BCC demonstrated complete histologic tumor resolution (Table I). Clinically, treatment sites demonstrated similar healing as electrodesiccation and curettage sites, with healing over several weeks and resultant round scar (figure I). The subjects will continue to be followed at least twice annually for five years after the treatment.

DISCUSSION

Our study was limited by a small sample size, lack of a control group, and sampling of treatment sites with shave removal rather than complete excision. Nonetheless, the results of our study suggest that the 755-nm Alexandrite laser may be an effective treatment for superficial and nodular BCC on the trunk and extremities in patients who do not desire surgery, and we believe that further investigation is warranted.

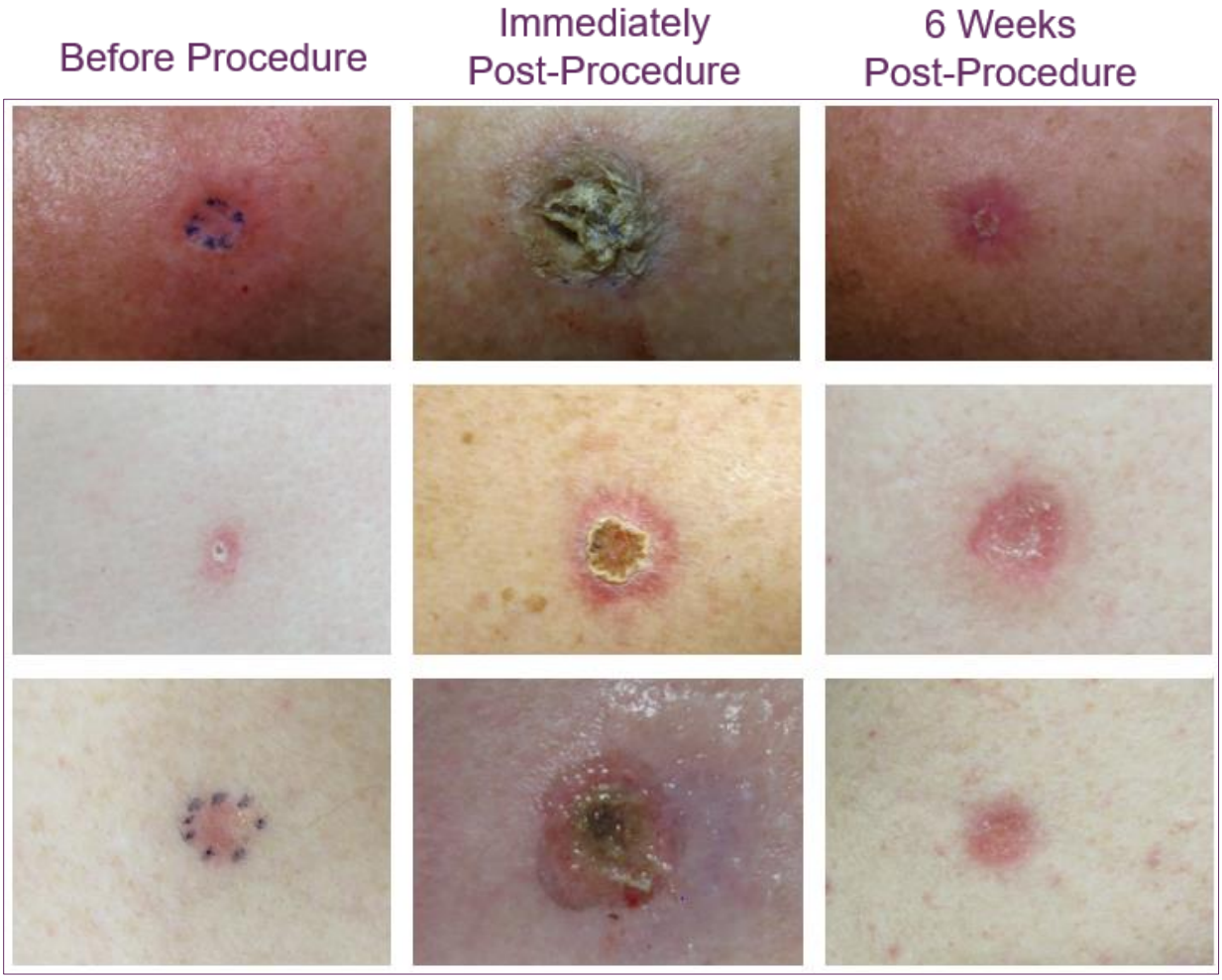
The Alexandrite laser is known to have vessel-selective properties as well as a greater depth of penetration compared to vascular selective lasers, such as the pulsed-dye laser (PDL).[2] These properties could explain the mechanism for the complete treatment of BCC in our subjects. Additionally, the high energy in the absence of dynamic cooling likely resulted in significant thermal damage to the BCC sites. It is important to note that scar outcomes following the 755-nm Alexandrite laser treatment of the BCC sites were not better than treating BCC sites with electrodesiccation and curettage (ED&C), and therefore the patient and the provider

Table 1.

Patient	Location of BCC	Histologic Subtype of BCC	Size of BCC (cm)	Clinical appearance immediately after treatment	Pathology, shave biopsy, 6 weeks after treatment	Clinical appearance 6 weeks after treatment
1	Back	Superficial & Nodular	0.4 x 0.4	eschar	No residual BCC	scar with scale
2	PUE	Superficial	0.6 x 0.6	eschar	No residual BCC	scar
3	Back	Superficial	1.3 x 1.2	eschar	No residual BCC	scar
4	Shoulder	Superficial	1.5 x 1.5	eschar	No residual BCC	scar with crust
5	Shoulder	Nodular	0.5 x 0.5	eschar	No residual BCC	scar with scale
6	Back	Nodular	0.8 x 0.8	eschar	No residual BCC	scar with crust
7	DUE	Superficial	1.3 x 0.8	eschar	No residual BCC	scar with crust
	Shoulder	Superficial	1.5 x 1.3	eschar	No residual BCC	scar with crust
8	Clavicle	Superficial	1.1 x 0.6	eschar	No residual BCC	scar
9	Back	Nodular	0.6 x 0.5	eschar	No residual BCC	scar
10	Shoulder	Superficial	1.0 x 1.0	eschar	No residual BCC	scar
	PUE	Superficial & Nodular	0.5 x 0.5	eschar	No residual BCC	scar
11	Shoulder	Superficial	2.0 x 1.7	eschar	No residual BCC	scar with eschar
12	Back	Nodular	0.6 x 0.5	eschar	No residual BCC	scar
13	DUE	Superficial	1.5 x 1.5	eschar	No residual BCC	scar with eschar
14	Back	Superficial & Nodular	0.8 x 0.3	eschar	No residual BCC	scar with scale
15	Shoulder	Nodular	0.9 x 0.7	eschar	No residual BCC	scar with eschar
16	PUE	Superficial	1.0 x 1.0	eschar	No residual BCC	scar with eschar
17	Chest	Nodular	0.4 x 0.4	eschar	No residual BCC	scar with eschar
18	Back	Superficial & Nodular	0.5 x 0.5	eschar	No residual BCC	scar
19	Back	Superficial & Nodular	0.7 x 0.5	eschar	No residual BCC	scar

PUE, Proximal Upper Extremity; *DUE*, Distal Upper Extremity

Figure 1. Pre, Immediately Post, and 6 Weeks Post Procedural Images of BCC Sites Treated with Laser Therapy.



should consider the cost effectiveness between different treatment modalities when making decisions regarding BCC treatments.

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