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Q-switched Nd:YAG Laser for Extrafacial Lichen Planus Pigmentosus: A Case Series Highlighting Outcomes and Risks

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ABSTRACT

Lichen planus pigmentosus (LPP) is a challenging pigmentary disorder that often affects extrafacial sites, yet most published data on laser treatment focus on facial involvement. We report 3 cases of biopsy-proven LPP treated with Q-switched neodymium: yttrium aluminum garnet (QS Nd:YAG) laser involving both facial and extrafacial areas. All patients experienced improvement in facial LPP, while outcomes on the neck, shoulders, and trunk were more variable. One patient developed koebnerized vitiligo after laser treatment to the neck, underscoring the need for caution in patients with underlying or suspected vitiligo. These cases highlight both the therapeutic potential and limitations of QS Nd:YAG lasers for extrafacial LPP and suggest that lower fluence approaches may offer safer alternatives in sensitive areas.

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INTRODUCTION

Lichen planus pigmentosus (LPP) is an acquired dermal melanosis that typically affects photo-exposed and flexural surfaces. Q-switched neodymium: yttrium aluminum garnet (QS Nd:YAG) lasers target dermal melanosis and have shown promise in the treatment of LPP. The majority of reported cases using QS Nd:YAG are confined to the face,[1] despite at least 64% of cases of LPP presenting on extrafacial skin.[2] Here, we describe 3 cases of LPP with facial and extrafacial involvement treated with QS Nd:YAG laser, highlighting both therapeutic response and treatment-related complications.

CASE SERIES

Three cases of biopsy-proven extrafacial LPP treated with QS Nd:YAG were included. In all cases, histopathology demonstrated lichenoid interface dermatitis with pigment incontinence, consistent with LPP.

Case 1: A 69-year-old male with Fitzpatrick type IV skin presented with LPP on the face, bilateral shoulders, chest, and lower back, refractory to topical corticosteroids. He underwent 16 treatments of QS Nd:YAG (spot size: 6 mm, fluence: 2.1–3.7 J, and frequency: 10 Hz; 1–2 passes for the face, 2–3 passes for the shoulders and chest, and 3–5 passes for the back) 1-4 weeks apart with moderate improvement of all sites (Figure 1). Additional maintenance treatments are currently being pursued.

FIGURE 1. (A-C) LPP of the lower back and bilateral shoulders before QS Nd:YAG. (D-F) Mild-moderate improvement of LPP after 16 treatments of QS Nd:YAG

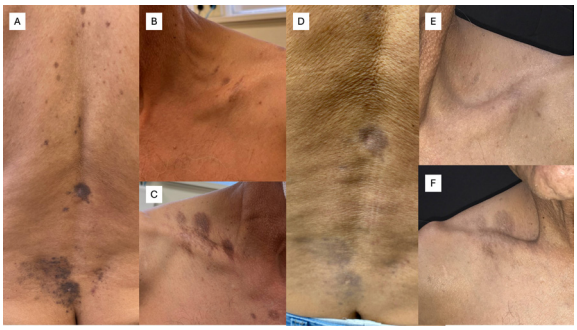


FIGURE 2. (A-B) LPP of the neck and forehead before QS Nd:YAG. (C-D) Marked improvement of LPP after 10 treatments of QS Nd:YAG.



Case 2: A 44-year-old female with Fitzpatrick type IV skin presented with LPP on the face and neck. Her LPP was refractory to topical corticosteroids, hydroquinone cream, prednisone (tapered from 60 mg daily to 5 mg daily over 4 months) and low-dose isotretinoin (20 mg daily for 9 months). She underwent 10 treatments of QS Nd:YAG (spot size: 4–6 mm, fluence: 2.0–2.7 J, frequency: 10 Hz; 1–3 passes) 4 weeks apart. Within 3 treatments, improvement was noted. To enhance the results, the patient was started oral tranexamic acid 325 mg BID. Marked improvement was seen on the face and neck (Figure 2). Improvements were sustained after discontinuing tranexamic acid.

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Case 3: A 42-year-old female with Fitzpatrick type IV skin presented with LPP on the face and neck. She was intermittently using topical corticosteroids, hydroquinone-based lightening creams, and retinoid creams without improvement. The patient underwent 6 treatments of QS Nd:YAG to the face (spot size: 6 mm, fluence: 2.5 J, frequency: 5 Hz; 1–2 passes) with significant improvement. Following improvement of the face, the patient elected to extent treatment to the neck. Because there was little improvement after 4 treatments (spot size: 6 mm, fluence: 2.5 J, frequency: 5 Hz; 1–2 passes), fluence was increased marginally for the fifth treatment (spot size: 6 mm, fluence: 2.8 J, frequency: 10 Hz; 1 pass). Two weeks later, she developed depigmented patches consistent with vitiligo (Figure 3). On Wood's lamp examination, a patch of vitiligo was noted on the lower back. Given no improvement after 7 weeks of observation followed by a 2-week course of high-potency corticosteroids, the patient was started on ruxolitinib 1.5% cream BID and achieved near complete repigmentation within 2 months.[3]

FIGURE 3. (A-B) LPP of the face and neck before QS Nd:YAG (C) Improvement in LPP of the face after QS Nd:YAG. (D) Laser-induced koebnerized vitiligo of the neck after a marginal increase in fluence. (E) Woods lamp highlighting depigmented patches. No improvement seen after 7 weeks of surveillance. (F) Complete resolution after a treatment course of ruxolitinib cream.



DISCUSSION

In this report, we present 3 cases of LPP involving both facial and extrafacial areas with varied outcomes. All 3 patients experienced improvement in facial LPP with QS Nd:YAG, consistent with existing literature demonstrating favorable outcomes in facial LPP.[1] By contrast, treatments off the face required more sessions, with less consistent improvement. In case 3, laser treatment of the neck induced koebnerized vitiligo in a patient with previously unrecognized vitiligo vulgaris, emphasizing the need for caution. The variable results of QS Nd:YAG off the face may be due to several factors, including thinner epidermis and dermis of the neck and lower density of keratinocyte stem cells. The neck has fewer hair follicles, and since the hair follicle bulge is a major stem cell reservoir, this may limit regenerative capacity in extrafacial skin.[4] Both vitiligo and LPP are T-cell mediated disorders, suggesting a possible immunologic link. Although colocalization of LPP and vitiligo vulgaris has not been reported to our knowledge, cases of coexisting lichen planus and vitiligo have been described.[5] This case reinforces the importance of exercising caution when using energy-based treatments in patients with vitiligo vulgaris. All 3 patients in this series had Fitzpatrick type IV skin, a population particularly susceptible to both hyperpigmentation and hypopigmentation following laser procedures. This further highlights the importance of careful parameter selection and monitoring in skin of color.

QS Nd:YAG lasers can be effective in the treatment of LPP, particularly on the face; however, caution must be exercised when treating extrafacial areas. Results may be less predictable, dyspigmentation may be more permanent, and multiple treatments may be needed before improvement is noted. Low-fluence laser toning, as used in melasma, may offer a safer approach for treating extrafacial LPP due to its lower risk of triggering pigmentary alteration. Repeated treatments may increase the risk of pigmentary complications, including leukoderma.[6] Further studies are needed to establish optimal QS Nd:YAG protocols for treating LPP, particularly in extrafacial regions where safety and efficacy remain less predictable. Limitations include the small sample size, retrospective design, and absence of standardized outcome measures.

DISCLOSURES

The authors have no conflicts of interest to disclose.

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