Verruca Plana Successfully Treated with a 2790-nm Erbium: Yttrium-scandium-gallium-garnet Laser

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Verruca plana is a cutaneous infection caused by the human papilloma virus. Although various treatment methods are currently available, most have limitations due to the risk of complications such as hyperpigmentation, edema, and scarring. Moreover, as the infection tends to spread easily, new verrucae can potentially develop, and treatment procedure times tend to be lengthy. Thus, novel treatment methods are required. The 2790-nm wavelength erbium:yttrium-scandium-gallium-garnet (Er:YSGG) laser is a superficial resurfacing laser. Here, we present a case of a 25-year-old woman with multiple verrucae treated using a 2790-nm Er:YSGG laser. Compared to traditional methods, this novel laser is convenient, produces better cosmetic outcomes, and is less time-consuming; it is therefore suitable for the treatment of facial verruca plana.

Key words

Verruca plana; Er:YSGG Laser

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INTRODUCTION

Verruca plana is a cutaneous infection caused by human papillomavirus (HPV), mainly types 3 and 10.^{1,2} Verruca mainly affects exposed body areas in young adults, and the members of this demographic are particularly sensitive to their appearance.³ Verruca plana presents as multiple and grouped flat-topped hyperkeratotic papules, which are of normal skin or brown color.¹

Many treatment options exist for verruca plana, including topical retinoids, imiquimod, cryotherapy, cimetidine, immunotherapy, pulsed dye laser, CO₂ laser, erbium:yttrium–aluminum–garnet (Er:YAG laser), and photodynamic therapy (PDT).^{3,4} However, treatment has its own limitations, such as the potential for hyper or hypopigmentation and scarring. Moreover, multiple and recalcitrant verruca plana that fail to resolve after previous treatments is challenging to treat. Therefore, a novel treatment with less downtime, a satisfactory safety profile, and good cosmetic results is still needed.

CASE REPORT

A 25-year-old woman presented with multiple flat-topped papules on her cheek that had been present since 2 years (Fig. 1A). Clinical examination revealed erythematous to skin colored flat-topped papules with a verrucous surface. A skin biopsy showed epidermal hyperkeratosis and acanthosis with infected koilocytes, which correspond to the diagnosis of verruca plana (Fig. 2). The patient was treated with oral ranitidine and a combination of cryotherapy and intralesional injections

of MMR (measles, mumps, rubella vaccine) at 2-week intervals for 2 months; however, the lesions did not respond to treatment. As the lesions were widely distributed over the cheek and chin and occupied a large area, we decided to use an erbium:yttrium–scandium–gallium–garnet (Er:YSGG) laser (Cutera®, Brisbane, CA, USA). The treatment parameters used with the Er:YSGG were 2.2 J/cm² with a 400-μs pulse duration. Local anesthesia was applied before treatment to reduce pain. Laser treatment was performed every 4 weeks. After three repeated sessions of the laser treatment, most of the lesions were resolved, without erythema or pigmentation (Fig. 1B).

DISCUSSION

Er:YSGG lasers with a 2790-nm wavelength are ablative resurfacing lasers and used to treat acne scars and epidermal dyschromia. The Er:YSGG laser has a medium water absorption coefficient, between that of a CO₂ laser and an Er:YAG laser, which means it induces less thermal damage, thereby creating minimal scarring compared to a CO₂ laser and provides improved remodeling compared to a Er:YAG laser.⁵ Histopathologically, verruca plana shows hyperkeratosis and acanthosis of the epidermis and koilocytes in the upper epidermis.⁶ Ross et al. reported that biopsies taken from the area irradiated by a Er:YSGG laser showed a zone of vacuolated and coagulated epidermis.⁵ Therefore, the mechanism of action is thought to be induction of damage to the infected keratinocytes in the epidermis as a result of resurfacing.

Er:YSGG lasers have two benefits compared to previous treatment options. First, they can be used to treat a large area of lesions in a shorter period of time than

Fig. 1. (A) Before treatment: remarkable verrucous lesions on the cheek. (B) After treatment: significant improvement of the verrucous lesion after three repeated sessions.

Fig. 2. Histopathologic findings of lesion consistent with verruca plana, showing hyperkeratosis and acanthosis with definite koilocytosis (H&E, ×100).

conventional techniques, as Er:YSGG lasers deliver thermal damage to a large surface area per treatment unit. This advantage of Er:YSGG provides convenience to the operator as well as to the patient. PDT can also treat a large area per irradiation; however, its prolonged incubation period (2–6 hours) is a limitation.¹ Second, Er:YSGG lasers create less pain and scarring than CO₂ lasers because they deliver a lower thermal load.⁷ As the face is an area of major cosmetic concern, treatments that induce scarring and hyperpigmentation are not appropriate approaches to treat facial verruca. Therefore, an Er:YSGG laser may offer an alternative treatment option with a shorter operating time, less downtime, and fewer side effects.

Our case suggests that Er:YSGG laser treatment may be an effective therapy for verruca plana because of its short time duration and convenience, in addition to its low incidence of side effects. Further studies in a larger population are required to determine the optimal regimen for recalcitrant verruca plana.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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