

Keratosis Pilaris Atrophicans Faciei: A Case Treated with 585 nm Diode Laser, a Novel Fractional Solid-State

Melis Gönülal^{1,*}, Sinem Karaca^{2,*}, Didem Didar Balci^{1,*}

¹Department of Dermatology, Izmir City Hospital, İzmir, Turkey; ²Department of Dermatology, Private Practice Clinic, İzmir, Turkey

*These authors contributed equally to this work

Correspondence: Melis Gönülal, Department of Dermatology, Izmir City Hospital, İzmir, Turkey, Tel +905301569743, Email drmelis@gmail.com

Abstract: Keratosis pilaris atrophicans faciei (KPAF) is a rare, hereditary, follicular disorder categorized in the atrophicans subtypes of keratosis pilaris (KP). Nowadays it can be treated with light and laser devices. Lasers with wavelengths <600 nm, especially pulsed dye laser (PDL), are effective for treatments of KPAF. Here, we present a case with KPAF treated with 585 nm diode laser, a kind of laser system functioning with differential wavelength modified optically pumped semiconductor (D-WMOPS) technology. Our case is the first patient reported to have been treated with this laser technology in the literature.

Keywords: keratosis pilaris atrophicans faciei, keratosis pilaris, diode laser, KPAF, KP

Introduction

Keratosis pilaris atrophicans faciei (KPAF), in other saying ulerythema ophryogenes, is a rare, hereditary, follicular disorder categorized in the atrophicans subtypes of keratosis pilaris (KP). It is mostly seen in children and adolescents and it can persist through adulthood. Its mechanism is complicated and not yet clearly understood.¹ Genetically, autosomal dominant and autosomal recessive inheritance have been identified.² Keratinization and inflammation become in the follicles and then atrophy occurs. On physical examination, it can be seen follicular, horny papules with an erythematous halo of the cheeks, forehead, chin and eyebrows, and a gradual loss of hair begins.³ There are different treatment models but an effective treatment method has not yet been found.⁴ Here, we present a case with KPAF treated with 585 nm diode laser, a novel fractional laser system with differential wavelength modified optically pumped semiconductor (D-WMOPS) technology.

Case Report

A 29-year-old male with KPAF applied to dermatology outpatient clinic of University of Health Sciences, Izmir Tepecik Training and Research Hospital. Clinically, there were follicular, horny and erythematous papules on his beard area, especially along the beard border line on his cheeks (Figures 1–5). He had the pathology report of another hospital supporting the diagnosis as KPAF. He used tretinoin cream, urea 40% cream, oral isotretinoin and acitretin for treatment but all these methods did not work. We suggested 585 nm diode laser treatment for the patient. In the first session, laser therapy was performed using a fluence of 5 w, a pulse duration of 20 ms, a spot size of 1.2 mm for cheeks and 5 w, 22 ms, 1.2 mm for ears, and then at from second to fifth sessions a fluence of 5 w, a pulse duration of 20 ms, a spot size of 1.2 mm for all areas one month apart. After 5 months we observed significant improvement at all areas with lesions from our point of view (Figures 1–5). Laser treatment of the case continues monthly. Mild erythema may occur after each session as side effect. The authors obtained written consent from patient for their photographs and medical information to be published in print and online and with the understanding that this information may be publicly available. Patient



Figure 1 Right side of face.



Figure 2 Left side of face.

consent form was not provided to the journal but is retained by the authors. İzmir Tepecik Training and Research Hospital's approval was required and provided to publish the case details.

Discussion

A novel fractional laser system with D-WMOPS technology can produce a pure 585 nm wavelength as pulsed dye laser (PDL), which has been used to treat vascular and pigmented skin lesions. PDLs use the high peak power and the sudden burst of short pulses and therefore they may break down the vessel walls with subsequent purpura. This novel fractional 585 nm diode laser with D-WMOPS technology can produce a pure 585 nm wavelength under a “steady-state” thermal condition and slowly heat the target. In PDLs, the risk of postinflammatory hyperpigmentation raises in darker skin phototype although purpura is considered a therapeutic endpoint in PDL treatment. The 585 nm diode laser with D-WMOPS technology heats the vessels gently and steady therefore this technology would be more acceptable for sensitive areas cosmetically such as face. Pain is tolerable and no purpura appears at the treatment areas. If all this data is considered, this new laser technology has various advantages than conventional PDL.⁵ Nowadays KP and its subtypes



Figure 3 Right side of face crossed, front view.



Figure 4 Left side of face crossed, front view.

can be treated with light and laser devices that are therapeutic options for different skin diseases.⁶ Laser treatment (PDL) was used firstly by Clark et al for KPAF with 12 cases in 2000. Since then, laser treatments have been considered as important options among all therapeutic options for KP, keratosis pilaris rubra (KPR), and KPAF.⁷ In the literature, PDL, intense pulsed light and carbon dioxide laser were used for KPAF treatment.⁶ Lasers with wavelengths <600 nm, especially PDL that used in a case report, two case series, and a prospective cohort study, are effective for treatments of KPR and keratosis pilaris atrophicans (KPA) including KPAF.⁸ We did not determined any cases with KPAF treated with 585 nm diode laser with D-WMOPS technology in the literature. In the study of Gonzalez et al,⁹ PDL at 595-nm wavelength was used for the cases of KPR and KPAF, a case series with 10 patients. In this research, three cases achieved complete resolution of erythema, other seven cases achieved clearance of erythema over 75%. One patient presented postinflammatory hyperpigmentation for 7 months.



Figure 5 Full face.

In conclusion, our case with KPAF is the first patient reported to have been treated with 585 nm diode laser with D-WMOPS technology in the literature. Therefore, we think this new technology may be an alternative, safety and efficacy therapeutic option for KPAF treatment. Further large-scale randomized controlled studies are required to determine the optimal protocol of the treatments.

Funding

The authors have indicated they have no funding sources.

Disclosure

The authors have indicated they have no potential conflicts of interest to disclose for this work.

References

1. Fekete GL, Fekete L, Neagu N, Bacărea V, Drăgănescu M, Brihan I. Keratosis pilaris atrophicans faciei: an observational, descriptive, retrospective clinical study. *Exp Ther Med*. 2021;22(5):1331. doi:10.3892/etm.2021.10766
2. Callaway SR, Leshner JL Jr. Keratosis pilaris atrophicans: case series and review. *Pediatr Dermatol*. 2004;21(1):14–17. doi:10.1111/j.0736-8046.2004.21103.x
3. Liakou AI, Esteves de Carvalho AV, Nazarenko LP. Trias of keratosis pilaris, ulerythema ophryogenes and 18p monosomy: zouboulis syndrome. *J Dermatol*. 2014;41(5):371–376. doi:10.1111/1346-8138.12442
4. Algharbi N, Jazzar Y, Shadid A, Almesfer A. Ulerythema ophryogenes in a Saudi male: a case report. *Cureus*. 2022;14(7):e26593. doi:10.7759/cureus.26593
5. Pan PY, Wei KC, Wu JC, Lin JH. A novel fractional solid-state 585 nm laser on facial verruca plana: a report of three cases. *J Cosmet Dermatol*. 2022;21(5):1986–1988. doi:10.1111/jocd.14857
6. Kechichian E, Jabbour S, El Hachem L, Tomb R, Helou J. Light and laser treatments for keratosis pilaris: a systematic review. *Dermatol Surg*. 2020;46(11):1397–1402. doi:10.1097/DSS.0000000000002441
7. Clark SM, Mills CM, Lanigan SW. Treatment of keratosis pilaris atrophicans with the pulsed tunable dye laser. *J Cutan Laser Ther*. 2000;2:151–156. doi:10.1080/14628830050516416
8. Wang JF, Orlov SJ. Keratosis pilaris and its subtypes: associations, new molecular and pharmacologic etiologies, and therapeutic options. *Am J Clin Dermatol*. 2018;19(5):733–757. doi:10.1007/s40257-018-0368-3
9. Gonzalez JA, Boixeda P, Truchuelo Diez MT, Fleta Asin B. Keratosis pilaris rubra and keratosis pilaris atrophicans faciei treated with pulsed dye laser: report of 10 cases. *J Eur Acad Dermatol Venereol*. 2011;25(6):710–714. doi:10.1111/j.1468-3083.2010.03772.x

Clinical, Cosmetic and Investigational Dermatology

Dovepress

Publish your work in this journal

Clinical, Cosmetic and Investigational Dermatology is an international, peer-reviewed, open access, online journal that focuses on the latest clinical and experimental research in all aspects of skin disease and cosmetic interventions. This journal is indexed on CAS. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/clinical-cosmetic-and-investigational-dermatology-journal>