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Treatment of Diffuse Planar Xanthoma of the Face after One Session of 1,444-nm Neodymium-Doped Yttrium Aluminium Garnet Laser

Ji Min Lee, Seung Hyun Chun, Byoung Joon So, Min Gun Yoo, Sun Yae Kim[1], Il-Hwan Kim

Department of Dermatology, Korea University Ansan Hospital, Korea University College of Medicine, Ansan, [1]Global Plastic Surgery, Seoul, Korea

Dear Editor:

A 41-year-old man presented with a 10-year history of progressive diffuse plane xanthoma of the face, neck, upper extremities, and flank (Fig. 1). His triglyceride, lipoprotein, and cholesterol levels were normal. Other conditions (e.g., monoclonal gammopathy, lymphoproliferative disease, or normolipemic xanthomatous skin disease) were excluded on the basis of findings from lipid electrophoresis and immunoelectrophoresis, blood cell counts, radiography of the skull, and electron microscopy, which were consistent with diffuse idiopathic plane xanthoma. He received multiple CO_2 laser treatments at other hospitals, but with no curative effect. We proposed to remove the plane xanthoma with a 1,444-nm neodymium-doped yttrium aluminium garnet (Nd:YAG) laser (AccuSculpt; Lutronic Corporation, Goyang, Korea). Two 1×1 cm^2 test

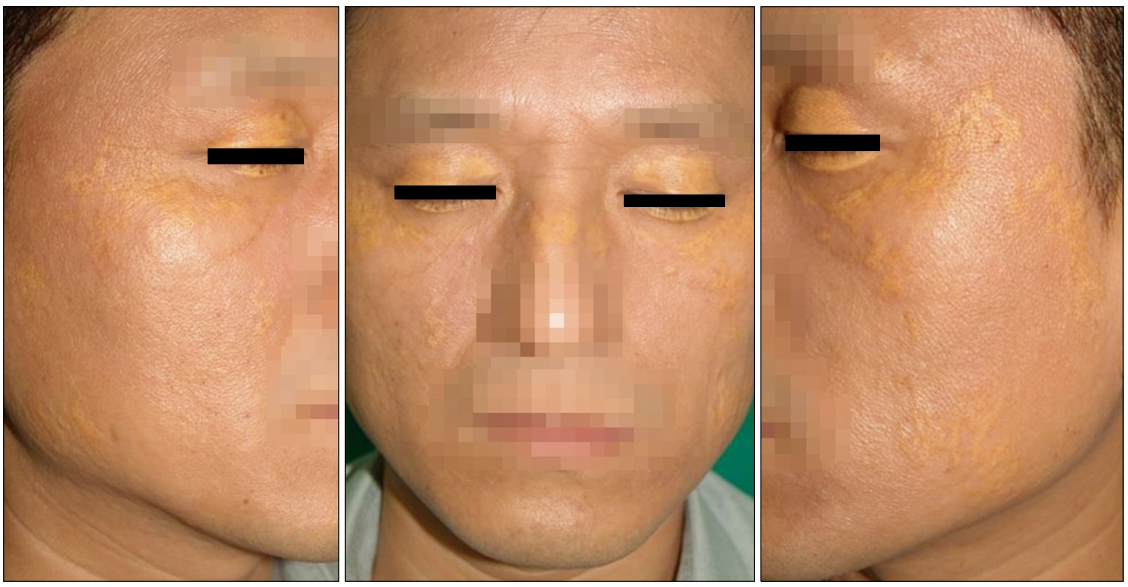

Fig. 1. Plane xanthoma. Yellowish maculopapular lesions had spread over the entire face.

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Corresponding author: Il-Hwan Kim, Department of Dermatology, Korea University Ansan Hospital, 123 Jeokgeum-ro, Danwon-gu, Ansan 15355, Korea. Tel: 82-31-412-5986, Fax: 82-31-412-5985, E-mail: kumcihk@ korea.ac.kr

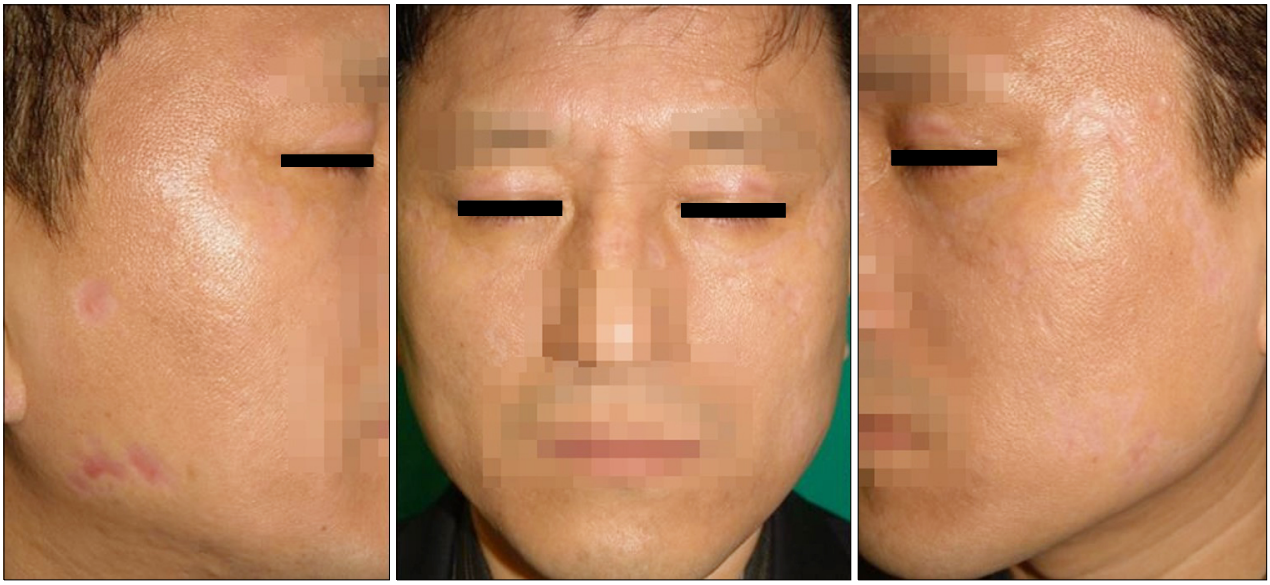

Fig. 2. Six months after the full lesional treatment, focal and mild textural changes and scarring are observed.

areas, one on each earlobe, were treated with 1,444-nm Nd:YAG laser by external beam irradiation with 80 J in total by using the following treatment parameters: pulse energy, 100 mJ; pulse rate, 20 Hz (power, 2.0 W). In both areas, the lesions were ablated into the superficial dermis until papillary bleeding occurred. After 1 month, both test areas showed resolution of the lesions without recurrence. Then, a 1,444-nm Nd:YAG laser was used for the full-face plane xanthoma lesions. The full-face plane xanthoma lesions were destroyed by irradiating with 918 J in total by using the external beam with the same treatment parameters as the test shots. Postoperatively, hydrocolloid dressings (DuoDERM Extrathin; Convatec International, Skillman, NJ, USA) together with antiseptic ointment were applied until reepithelization. After 1 month, the lesions showed erythema and some atrophic scars. There were no residual xanthoma lesions after 6 months; however, scar formation on the right lower cheek and textural changes in at least 50% of the treated area were observed (Fig. 2).

Most therapeutic options in the treatment of plane xanthoma are based on mechanical removal through excision, chemabrasion, dermabrasion, or ablative laser therapy[1]. Several studies suggest that the 1,444-nm laser achieves superior lipolysis compared with other laser wavelengths[2-4]. Theoretically, more effective laser lipolysis is anticipated with the 1,400-nm wavelength because it has a >10-fold higher affinity to fat than the 1,064-nm wavelength[3]. Youn and Holcomb[2] indicated that the 1,444-nm wavelength provided both the highest efficiency for fatty tissue ablation and the greatest thermal confinement compared with the 1,064- and 1,320-nm wavelengths. Tark et al.[3] reported a marked reduction in fat volume identified by using *in vivo* minipig and *in vitro* human fat experiments, with the 1,444-nm wavelength compared with the 1,064-nm wavelength. However, the mechanism of action of this laser in the treatment of xanthomas may depend not only on thermal lipolysis but also on nonspecific thermal effects. Superficial scar formation due to thermal damage to the surrounding tissue may act as a shield covering the leftover lesions underneath. To the best of our knowledge, this is the first study to describe the clinical application of a 1,444-nm laser for the treatment of xanthoma. In conclusion, 1,444-nm Nd:YAG laser therapy is an alternative treatment for facial diffuse plane xanthoma that shows fast reepithelialization. However, the risk of skin textural change and scar formation remains a challenge.

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