Combination Treatments of 755 nm Alexandrite Laser with 1,064 nm Nd:YAG Laser Toning for Café Au Lait Macule

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Café au lait macule (CALM) is a benign epidermal hyperpigmentation disorder that can be idiopathic or associated with neurocutaneous syndromes. CALM responds to many therapeutic methods showing various treatment outcomes and recurrence rates. Each laser of 755 nm alexandrite and 1,064 nm Nd:YAG toning is used for treatment of benign pigmented lesions, however there is no combination approach for use of these lasers for treatment of CALM. This report describes the case of a 20-year-old male who presented with CALM on his face without a personal or family medical history associated with neurofibromatosis. In this case, combination laser of 755 nm alexandrite laser with 1,064 nm Nd-YAG laser toning showed relatively high efficacy in removing CALM without re-pigmentation.

Key words

Café au lait macule; 755 nm alexandrite laser; 1,064 nm Nd:YAG laser toning

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INTRODUCTION

Café au lait macule (CALM) shows hyperpigmented lesions, which have increased concentrations of melanin, located along the dermoepidermal junction in basal keratinocytes and melanocytes without melanocytic proliferation. So far, variety of therapeutic methods including bleaching creams, several types of Q-switched lasers, 511 nm continuous-mode copper vapor laser, and Erbium:YAG laser, have been used to treat CALM.¹ However, in most cases, clinical responses were variable, more than a single treatment was necessary to achieve clearance, and recurrence was very common.² To the authors' knowledge, there are only few investigations of combination laser treatment for CALM. As the backgrounds of this information, we tried to treat CALM by using combination therapy of 755 nm alexandrite laser with 1,064 nm Nd-YAG laser toning in our case.

CASE REPORT

A 20 year old Korean man visited the authors' hospital for the management of CALM on his face which was present since childhood (Fig. 1A). The patient had no personal or family medical history of relevance, and no history of neurofibromatosis or autoimmune diseases, and had not received any previous treatment for the condition. First, this patient was treated with 755 nm alexandrite laser (GentleMax®; Candela, Wayland, MA, USA) each monthly for 3 months. The laser setting was: 6 mm spot size, 3 msec pulse duration, 35 J/cm² fluence, 50 msec cooling time and 30 msec delay time. Two weeks after 3 times

of 755 nm alexandrite laser treatments, additionally, this patient was treated with six sessions of 1,064 nm Nd:YAG laser toning (Spectra XT®; Lutronic Corporation, Goyang, South Korea) 2-weeks intervals for 3 months. All lesions were treated using a 4mm spot size, 2.5 to 3.0 J/cm² fluence and two passes with appropriate overlap to achieve mild erythema. The side effects according to each laser system included transient erythema and post-therapy scaling. However, they complained of no major adverse effects such as blistering, scarring, purpura and post-therapy dyschromia. Initial noticeable improvement was noted after 3 months of treatment (Fig. 1B), and the lesion showed a marked improvement after 6 months (Fig. 1C). When the treatment was finished, the patient was satisfied with its outcome. At the 12 months follow up after the last treatment, the CALMs had not recurred.

DISCUSSION

CALM are a common pigmentary disorder. The exact etiology of CALMs is unknown, although histological studies reveal an increased number of melanosomes in the basal layer of the epidermis. Laser therapies, including treatment with a copper vapor laser, 532 nm Q-switched Nd:YAG laser, Q-switched ruby laser, Q-switched alexandrite laser, Erbium:YAG and pulsed dye laser, have been used to treat CALM.¹ The outcomes have been variable, with response rates ranging from 20% to 57%. Furthermore, recurrence rates in previous studies vary from 0% to 67%.² The mechanism of recurrence may be linked to the activation of melanin synthesis in melanocytes during post-treatment healing. However, our case has great ef-

Fig. 1. Changes of patient's café au lait macules during treatment periods.

ficacy of laser treatments and been never showing recurrence after 1 year.³

The possible mechanism of this result in our case may be due to combination laser therapy of 755 nm alexandrite laser with 1,064 nm Nd:YAG laser toning. The 755 nm alexandrite laser has been widely used for CALM, due to it selectively destroys developed melanosomes with minimal injury to surrounding cellular structures.^{4,5} And furthermore, the 1,064 nm Nd:YAG laser toning is proposed to cause the fragmentation of melanin granules and reduce the number of melanosomes without cellular destruction with a sub-photo-thermolytic fluence.⁶ Recently, it has produced favorable outcomes, showing 50% to 74% response rates in many benign pigmented disorders, such as melasma and nevus of Ota.⁷ Also, case report on CALM treatment has appeared.³

To the best of our knowledge, this is the first report of a patient presenting with CALM who was treated successfully with combination lasers of 755 nm alexandrite laser with 1,064 nm Nd:YAG laser toning in a safe and easy manner. Although, in this case, diagnosis was based only on clinical observation, the present study may support the clinical efficacy. However, optimized, prospective studies in larger populations will be required to confirm our findings.

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