

Dual-Laser Approach Using 1064 nm Q-Switched Nd:YAG and 595 nm Pulsed Dye Lasers for the Treatment of Acquired Bilateral Nevus of Ota-like Macules (ABNOM): A Case Study

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Abstract: Acquired bilateral nevus of Ota-like macules (ABNOM), also known as Hori nevus, is a common form of acquired dermal facial melanocytosis, particularly among individuals with darker skin tones, especially Asian women. We present the case of a 40-year-old single woman with Fitzpatrick skin type IV who had experienced hyperpigmentation over the bilateral temporal and infraorbital regions for the past 10 years. A diagnosis of ABNOM was made based on clinical presentation. The patient underwent a total of 17 treatment sessions over a period of two years and seven months, utilizing a combination of 1064 nm Q-switched (QS) Nd:YAG laser and 595 nm pulsed-dye laser (PDL), administered at intervals of one to two months. Pre- and post-treatment photographs were visually evaluated to assess outcomes. The treatment yielded favorable results, with gradual lightening of the pigmentation over multiple sessions. No severe side effects, such as post-inflammatory hyperpigmentation (PIH), were observed. The patient reported only mild pricking pain during each session of QS Nd:YAG laser and PDL treatment. In conclusion, the combination of 1064 nm QS Nd:YAG laser and 595 nm PDL may serve as a promising treatment modality for ABNOM. Future studies with larger sample sizes and objective assessment tools are warranted to validate and optimize this treatment approach.

Keywords: ABNOM, Q-switched Nd:YAG 1064nm, 595 nm Pulsed-dye laser, Post-inflammatory hyperpigmentation

Introduction

Acquired bilateral nevus of Ota-like macules (ABNOM), also called Hori's nevus, was first reported by Hori et al. in 1984 [1]. This condition is marked by blue-brown macules that appear symmetrically on the face and typically emerge

later in life, often during the fourth or fifth decade of life [2]. In ABNOM, elongated and slender pigment-laden cells are observed scattered throughout the upper dermis, with melanocytes more commonly localized in perivascular regions. [3]. ABNOM can lead to

considerable cosmetic and psychosocial challenges for those affected.

Laser therapy has been employed since the 1990s for the treatment of ABNOM [4]. For the past 20 years, Q-switched (QS) lasers such as ruby, alexandrite, and Nd:YAG with nanosecond pulse durations have been employed in the treatment of ABNOM, utilizing the concept of selective photothermolysis [5]. These lasers are generally effective and have been used in clinical practice for the treatment of ABNOM [2,6-8]. Among the QS lasers, the Nd:YAG laser has received the most attention. A study conducted among Korean patients found that the QS Nd:YAG laser is safe and effective in the treatment of ABNOM [2]. However, patients may experience various complications during and after laser treatment, including pain, erythema, edema, blistering, post-inflammatory hypopigmentation, and post-inflammatory hyperpigmentation (PIH) [9].

Interactions between vascular structures and perivascular melanocytes in ABNOM lesions may significantly contribute to hyperpigmentation [10], as one study demonstrated that endothelial cells contribute to skin pigmentation by activating endothelin receptors [11]. Therefore, therapies targeting the vasculature may offer therapeutic benefits in the treatment of ABNOM [10]. In this report, we present a case of ABNOM that showed clinical improvement following treatment with a 1064 nm QS Nd:YAG laser combined with a 595 nm pulsed dye laser (PDL), with no observed side effects.

Case Presentation

A 40-year-old female with no known medical illness (NKMI) and no known drug allergies (NKDA) presented to our clinic with concerns about pigmentation over the temporal and under-eye areas, which had been present for more than 10 years. The pigmentation initially

appeared over the temporal regions and progressively extended downward. She had not sought any medical advice or treatment for the pigmentation previously due to financial constraints. She is single and works as a marketing officer. Family history revealed that her mother is suspected to have melasma and is currently undergoing treatment. Physical examination revealed round, dark brown macules extending from the temporal to the periorbital area bilaterally, as shown in **Figure 1**. There was no evidence of neurological involvement or visual disturbances. The patient was clinically diagnosed with ABNOM.

Management and Outcome

Before initiating laser therapy, written consent was obtained from the patient, outlining the procedure, indications, and potential complications. Treatment commenced in August 2022 using a QS Nd:YAG laser (Spectra XT™, Lutronic Corporation, Korea) with a 4 mm spot size, 5 Hz frequency, and 4.0 J/cm² fluence, delivered in a single pass per session. The QS Nd:YAG laser fluence was initially set at 4.0 J/cm² and was gradually increased with each session to achieve the clinical endpoint of erythema and mild petechiae. For the first 10 sessions, the treatment was combined with 595 nm PDL (Spectra XT™, Lutronic Corporation, Korea), with a fluence between 0.15 and 0.30 J/cm², a 5 mm spot size, and a frequency of 2 Hz, delivered in a single pass per session; however, this combination was discontinued thereafter due to the patient's limited budget. The patient underwent a total of 17 laser therapy sessions (**Table 1**) at intervals of one to two months. The overall duration of treatment was 2 years and 7 months. The patient was advised to apply sunblock and moisturizer immediately after each session and to continue their consistent use to minimize the risk of hyperpigmentation.

Table 1. Laser parameters used for 1064 nm QS Nd:YAG laser and 595 nm PDL in the treatment of ABNOM.

Session	Mode	Fluence (J/cm ²)
1	QS Nd: YAG	4.0
	PDL	0.18
2	QS Nd: YAG	4.8
	PDL	0.24
3	QS Nd: YAG	6.0
	PDL	0.30
4	QS Nd: YAG	5.6-5.8
	PDL	0.30
5	QS Nd: YAG	6.0
	PDL	0.30
6	QS Nd: YAG	5.4
	PDL	0.26
7	QS Nd: YAG	5.4
	PDL	0.24
8	QS Nd: YAG	5.2-5.4
	PDL	0.19
9	QS Nd: YAG	5.4-5.6
	PDL	0.19
10	QS Nd: YAG	5.4-5.6
	PDL	0.17
11	QS Nd: YAG	5.4
12	QS Nd: YAG	5.4
13	QS Nd: YAG	5.2
14	QS Nd: YAG	5.2
15	QS Nd: YAG	5.2
16	QS Nd: YAG	5.6
17	QS Nd: YAG	4.6



Figure 1. Photograph of the patient before treatment, with visible pigmentation over the temporal and periorbital areas.

Photographs were taken before and after each treatment session to evaluate any clinical changes. Notable cosmetic improvements were observed after 10 sessions of QS Nd:YAG 1064 nm laser therapy in combination with 595 nm PDL treatment (**Figure 2**), as well as after the final session (**Figure 3**). To assess the safety of the treatment, textural changes, scarring, and pigmentation alterations were monitored. No changes were observed in these parameters. The patient reported mild pricking pain during the procedure; however, no other immediate or delayed adverse events were noted.



Figure 2. Photograph of the patient after 10 sessions, showing notable cosmetic improvement in pigmentation on both temporal and periorbital areas.



Figure 3. Photograph of the patient after 17 sessions of treatment, showing further improvement in pigmentation on the temporal and periorbital areas.

Discussion

ABNOM, also known as Hori's nevus, is a common form of dermal melanocytic hyperpigmentation first reported in 1984. The lesions are typically round, oval, or polygonal with well-defined borders. They are primarily located in the bilateral zygomatic regions but may also affect the forehead, temples, eyelids, and the root or alae of the nose. In some cases, the skin

above the upper lip is involved [12]. The malar region of the cheek is most commonly affected in ABNOM, a condition that requires careful differentiation from other similar dermatological presentations such as Nevus of Ota, female facial melanosis, and melasma [2].

ABNOM poses significant treatment challenges due to two primary factors: First, the melanocytes are situated perivascularly, which increases the risk of post-inflammatory hyperpigmentation following laser therapy. Second, the condition is frequently associated with melasma, resulting in concurrent epidermal pigmentation that further complicates management [13]. Vascular-targeted therapy may offer therapeutic benefits in the treatment of ABNOM.

The PDL, operating at wavelengths of 585 nm or 595 nm and based on the principle of selective photothermolysis, has been considered the gold standard for treating small-caliber, superficial blood vessels since its introduction into clinical practice in 1986 [14]. PDL is widely recognized as a standard procedural treatment for vascular lesions such as erythema and telangiectasia, due to its strong affinity for oxyhemoglobin as the chromophore target [15].

Given PDL's well-established role in targeting vascular lesion, its combination with QS Nd:YAG laser may represent a promising therapeutic approach for ABNOM. However, to our knowledge, no prior reports have described this combination for ABNOM treatment. In this case report, we observed that the combined use of QS Nd:YAG laser and PDL led to clinical improvement of the ABNOM lesion, with no side effects reported. The addition of a vascular-targeted laser may have contributed to this improvement. Similarly, another case report demonstrated improvement in ABNOM lesions using combination laser therapy, where one of the lasers targeted vascular structures, in a patient who was refractory to treatment with a picosecond-domain 1,064-nm Nd:YAG laser. [10].

However, in our case, the patient discontinued the combination treatment after 10 sessions. Continuing with the combined approach using the QS Nd:YAG laser and the 595 nm PDL for additional sessions might have further reduced the overall duration of treatment.

Conclusion

The combination of a 1064 nm QS Nd:YAG laser with a 595 nm PDL may offer a promising therapeutic approach for the treatment of ABNOM. Further investigations with larger sample sizes and longer follow-up periods are needed to validate the efficacy and safety of this combined approach. Comparative trials with monotherapy could help determine whether this combination reduces treatment duration or side effects. Additionally, the use of objective assessment tools may enhance the evaluation of pigmentation improvement.

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Potential Conflict of Interest

The author declares no potential conflicts of interest.

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