

Nevus Hori Treated with Laser Combination: A Case Report

Chesia Christiani Liuwan, M. Yulianto Listiawan

Department of Dermatology and Venerology, School of Medicine, Universitas Airlangga, Dr. Soetomo General Hospital, Surabaya, Indonesia

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Abstract: Introduction: Dermal melanocytosis include the mongolian spot, blue nevus, nevus of Ota, nevus of Ito, and nevus hori. Nevus hori is also known as acquired bilateral nevus of Ota-like macules (ABNOM). Nevus Hori is characterized by its bilateral hyperpigmentation on the forehead, eyelids, cheeks, and/or nose and appears at third decade of life. Objective: To evaluate the clinical manifestation and management of Nevus Hori. Case: A 16-year-old Javanese female patient, complaint about dark patches in left her cheek since 2 years ago. Histopathology has not been done because patient refused to do the biopsy. Diagnosis of Nevus Hori is made based on anamnesis and clinical manifestations. The patient is treated with combination CO₂ fractional laser and 1064 nm Nd:YAG laser for 3 sessions and shows improvement. Conclusion: Among facial dermal melanocytosis (FDM), nevus of Ota and Nevus Hori are clinically similar and both diseases cause aesthetic problems as they develop on the face and are not self-limited. This laser combination aimed to increase the ability to remove pigment. Nevus Hori is diagnosed based on anamnesis and clinical finding. Laser therapy is the therapy of choice because of excellent results but cost and availability are the limiting factors.

1 INTRODUCTION

Disorders of melanin pigmentation can be divided on morphological grounds into two types. The first is hypermelanosis, where there is an increased amount of melanin in the skin. The second type is hypomelanosis, where there is a lack of pigment in the skin. Furthermore, hypermelanosis can be divided on histological grounds into epidermal hypermelanosis, dermal hypermelanosis, and mixed epidermal and dermal hypermelanosis (Lee et al., 2004). The dermal hypermelanosis due to the presence of melanin-producing dendritic melanocytes that lie in the dermis is named dermal melanocytosis, which includes nevus of Ota, nevus of Ito, Mongolian spots (Watanabe, 2014).

Dermal melanocytosis is usually localized, especially common among Asians. Clinically, it shares bluish-grey coloration. When a sufficient number of melanin-containing cells are present in the dermis, various clinical forms are reported, depending on their onset and distribution (Lee et al., 2004; Watanabe, 2014). While most dermal melanocytosis are congenital or have an onset in early childhood, there is a group that is clearly

acquired, with an onset in adult life. Park et al., (2014). In this report, dermal melanocytosis appearing on the face, named facial dermal melanocytosis (FDM) has been reviewed.

Acquired bilateral nevus of Ota-like macules (ABNOM), also named Hori nevus, was first described by Hori et al in 1984. Clinically, ABNOM is characterized by multiple speckled blue-brown and/or slate-gray macules occurring bilaterally on the malar regions or less commonly forehead, upper eyelids, and cheeks and nose. It most commonly presents in Asian women after the third decade of life with 89% described as having Fitzpatrick skin phototype IV (Lee et al., 2004; Watanabe, 2014).

We report a case of an Indonesian female, aged 16 years old, who suffered Nevus Hori. She complained about the dark patches which appeared in her left cheek since 2 years ago. She has been treated with combination of CO₂ fractional laser and Nd:YAG laser. This report discusses about the clinical presentation, diagnosis, and treatment. The aim of this study is to evaluate the clinical manifestation and management of Nevus Hori.

2 CASE

16-years-old female, came to Dermato-Venereology Outpatient Clinic of Dr. Soetomo General Hospital Surabaya on December 22nd 2016 with main complain dark patches at her left cheek since 2 years ago. The dark patches were getting wider. She never complain about itchy, numbness or pain sensation on her left cheek. She had no complained about visual disturbances or dizzy.

She already gone to general doctor at Jombang and got 3 type of cream for morning and night, but there was no improvement. She usually uses facial foam that she get from supermarket. She never has same complaint before. There are no family members who have the same complaint as her. There were no history of food and drug allergy in the patient and her family, no history of atopy in the patient and her family.

She is a high school student and usually goes to school by bicycle or on foot. She prefer to stay at home and helping her mother doing the housework than playing outside. She only has direct sun exposure during going to school and going home.

General physical examination was within normal limit, with no sign of anemic, icterus, cyanotic or respiratory distress. The blood pressure was 110/70, pulse rate was 96 times per minute, respiratory rate 20 times per minute and body temperature was 36,3 °C. No abnormalities found on thorax and abdominal examination. No swelling on his extremity.

From dermatological examination on left cheek region, there were hyperpigmented macule, vary in size, bluish in color, sharply margined, and from oculi region there was no episcleral pigmentation.

Laboratory result revealed the complete blood count all within normal limit. The histology examination has not been done yet because patient

still refuse to do the biopsy. Patient has been consulted to ophthalmologist and the result is all within normal limit. The patient's visus is normal (6/6) and there are no pigmentation in her eyes. The tonometry and funduscopy examination also revealed normal result and no sign of glaukoma in this patient.

The patient was treated with CO₂ fractional laser and Nd:YAG laser 1064 nm for 3 sessions and the lesion became lighter. The progression and improvement of the patient can be seen in the figures

3 DISCUSSION

Pigmentation disorders of the skin can either be hypomelanotic, hypermelanotic, or may present with a pattern of mixed hypo- and hypermelanosis. The diagnosis of these disorders can be quite challenging (Lee et al., 2004). Dermal melanocytosis define a broad group of congenital and acquired melanocytic lesions characterized by the presence of intradermal dendritic, variably pigmented, spindle shaped melanocytes with or without presence of dermal melanophages. This group includes Mongolian spot, nevus of Ota, nevus of Ito and acquired bilateral nevus of Ota-like macules (ABNOM), and other unusual cases of dermal melanocytosis that have been introduced to the literature as part of this category on the basis of similar histopathological findings (Watanabe, 2014).

From the standpoint of age of onset, there is overlap between classical nevus of Ota and Hori's. The distribution of pigmentation is identical between nevus of Ota and Hori's nevi, although mostly unilateral in nevus of Ota. The histology of Hori's is identical to nevus of Ota.



Figure 1: Comparison of 1st Laser session (left), 2nd Laser session (middle), and 3rd Laser session (right).

3.1 Nevus Hori

Acquired bilateral nevus of Ota-like macules (ABNOM), also named Hori nevus, was first described by Hori et al in 1984. Clinically, ABNOM is characterized by multiple speckled blue-brown and/or slate-gray macules occurring bilaterally on the malar regions or less commonly forehead, upper eyelids, and cheeks and nose. It most commonly presents in Asian women after the third decade of life (Cho et al., 2009; Park et al., 2014; Watanabe, 2014).

Hori et al hypothesized that the pathogenesis of ABNOM may be attributed to later reactivation of preexisting misplaced dermal melanocytes that may result from faulty migration during embryological development, dropping off from the basal layer of epidermis or migration from follicular bulb melanocytes. Mizoguchi and Mizushima concluded that there are “two hits” are needed for the development of ABNOM: the first representing the ectopic placement of inactive, poorly melanized dermal melanocytes at birth or soon thereafter and the second, the activation of these melanocytes in response to ultraviolet exposure, excessive sex hormone, chronic inflammation such as atopic dermatitis, or other unknown triggers (Murakami, 2000; Park et al., 2014).

The diagnosis of ABNOM was made by clinical appearances, according to the description by Hori et al. and skin biopsies were not performed. The color of ABNOM was categorized into one of four groups, namely brown, slate-gray, brown-blue, and blue (Cho et al., 2009).

3.2 Nevus Ota

Nevus of Ota or nevus fuscoeruleus ophthalmomaxillaris was first described by the Japanese dermatologist Ota in 1939 as a dermal melanocytic hamartoma that presents as bluish hyperpigmentation along the ophthalmic, maxillary and mandibular branches of the trigeminal nerve (Metha & Balachandran, 2007; Lapreere et al., 2012). It is most frequently seen in the Asian population, has a female predominance, and is usually congenital, although appearance in early childhood or at puberty has been described (Kumari & Thappa, 2006; Lapeere et al., 2012).

The pigmentation of Ota's nevus is composed of flat blue black or slate grey macules intermingled with small brown specks. The intensity of pigmentation may be influenced by fatigue, menstruation, insomnia and weather. Mucosal

pigmentation may occur involving conjunctiva, sclera, and tympanic membrane (oculodermal melanocytosis), or other sites. Ocular melanosis in 22-77% cases is almost always ipsilateral and deep in the conjunctiva (Metha & Balachandran, 2007; Lapeere et al., 2012). Pigmentation may also affect the sclera, cornea, iris, choroid and less commonly the optic nerve, retrobulbar fat, orbit, periosteum and extraocular muscles (Metha & Balachandran, 2007). The pigmentation of mucous membranes of the head and neck is variable; tympanic membrane being most frequently affected although nasal, buccal, pharyngeal and rarely palatine mucosa may be involved (Sharan et al., 2005). At present, it is believed that nevus of Ota is caused by heteroplasia that occurs in melanocyte migration during embryonic development (Huang et al., 2013).

Nevus of Ota involves innervated areas of the first branch (V1) and second branch (V2) of the trigeminal nerve mainly affects the eye region and pars zygomatica, and the color of the skin lesion is brown or blue, the diameter of the area is 1–10 cm or larger.¹⁰ Tanino classified nevus of Ota into 4 types according to the skin lesion involvement area: Type I was mild, Type II was moderate, Type III was severe, Type IV was bilateral type (Huang et al., 2013).

In our report, the patient is female, age 16 years old with the symptom dark patches at her left cheek since 2 years ago. There are no patches since she birth. The dark patches were getting wider, and she also has ultraviolet exposure since she usually going to school by bicycle and on foot. According to this situation is suitable with the clinical manifestation of Nevus Hori or ABNOM. From the theory, ABNOM is an acquired dermal melanocytosis which induced by ultraviolet exposure, sex hormone, and chronic inflammation.

She never complain about itchy, numbness or pain sensation on her cheek. She had no complained about visual disturbances or dizzy. The patient's visus is normal (6/6) and there are no pigmentation in her eyes. The tonometry and funduscopy examination also revealed normal result and no sign of glaukoma in this patient. Nevus Hori is said to have lack mucosal involvement.

From physical examination at left cheek region there were hyperpigmented macule, vary in size, bluish in color, sharply marginated. In this case, the histopathology examination has not been done yet because the patient still refuse to do the biopsy. Nevus Hori tends to appear symmetrically at both cheek (malar area). In the other hands, Nevus Ota can appear unilaterally in one side of face. In this

case because the clinical manifestations appear on the left side only, so based on Tanino classification included in type I.

Pigmentary disorders appearing on the face, even if they are benign, frequently cause cosmetic and psychological problems to many people, especially women. As with most dermal pigmentary disorders, single treatment with topical bleaching agents or superficial-to medium-depth chemical peels is generally not effective for long-term pigmentary reduction or elimination.¹¹ Although methods such as dermabrasion, cryotherapy, surgical excision, and cosmetic camouflage had been attempted for FDM in the past, these have been largely replaced by pigment-selective lasers given the lower risk of scar formation and permanent hypopigmentation or depigmentation with these devices (Kunachak et al., 1996; Kar et al., 2011).

Three types of Q-switched lasers have been used widely to treat FDM. These include the Q-switched 694 nm Ruby laser, Q-switched 755 nm Alexandrite laser and the Q-switched 1064 nm Nd:YAG laser. Previous studies have shown that all of them were able to provide excellent results in treating FDM.

Because Q-switched (QS) laser devices have been widely accepted as the treatment of choice for nevus of Ota on the principle of selective photothermolysis and because ABNOM is histopathologically similar to nevus of Ota, QS lasers such as the QS ruby laser (QSRL), QS neodymium:yttrium-aluminum-garnet laser (QSNYL), and QS alexandrite laser (QSAL) have all been used for the treatment of ABNOM since the first report of Hori et al (Lee et al., 2009; Watanabe, 2014). The laser fluence used was 7 to 10 J/cm², at a repetition rate of 1 Hz, and with a spot size of 2 to 4 mm. The number of treatment sessions ranged from 1 to 6 (mean 2.3 sessions) with short treatment intervals (mean 2.2 weeks) (Watanabe, 2004).

In addition to local thermal destruction and stimulation, fractionated devices may also play an important role for drug delivery into the tissue and for extruding material out of the skin, as in the studies by Haedersdal et al. This has also been recently reported by Brian Wei Cheng using a combination between non ablative fractionated erbium : YAG laser and Q-switches Nd:YAG laser as an effective and safe treatment to treat Nevus Hori (Sakamoto et al., 2013; Tian, 2015).

After laser treatment, ABNOM showed a higher degree of erythema as well as a higher incidence and degree of Post Inflammatory Hyperpigmentation (PIH) compared to that of nevus of Ota. Several causes for the increased prevalence of PIH in

ABNOM after laser treatment are considered. First, the lesion in ABNOM was located in the superficial dermal layer and there were few epidermal melanocytes and melanin pigment. In the treatment of Q-switches laser, melanin acts as a chromophore, therefore melanin in the epidermis allows laser to be selectively absorbed so that the epidermal tissue becomes vacuolized due to the heat. The melanocytes and melanin pigment of the vacuolated epidermis are dropped into the dermis, and are presumed to induce PIH.

Next, melanocytes were especially clustered in the perivascular area in ABNOM, whereas in nevus of Ota melanocytes were evenly distributed throughout the dermal layer in between collagen fibers. The presence of many melanocytes in the perivascular area may lead to indirect vascular damage, increase melanogenesis, induce many types of inflammatory responses, and produce chemical substances. These process can induce PIH (Watanabe, 2014).

Patient already had Q-switched 1064 Nd:YAG laser combined with fractional CO₂ for three times and the lesion is having improvement although she has not satisfied yet. The patient is advised to continue the laser treatment and observed the occurrence of PIH. The prognosis of this case is good.

4 CONCLUSION

Pigmentary disorders appearing on the face frequently cause cosmetic and psychological problems to many people, especially women. The diagnosis of FDM can be quite challenging because of the similarity manifestation of Nevus of Ota and ABNOM. Q-switched laser give a promising result to treat this pigmentary problems. Combination with CO₂ fractional laser aimed to increase the ability to remove pigment.

REFERENCES

- Cho, S.B., Park, S.J., Kim, M.J., Bu, T.S., 2009. Treatment of acquired bilateral nevus of Ota-like macules (Hori's nevus) using 1064-nm Q-switched Nd:YAG laser with low fluence. *International Journal of Dermatology* 48, 1308–1312. doi:10.1111/j.1365-4632.2008.04061.x
- Huang, W.H., Wang, H.W., Sun, Q.N., Jin, H.Z., Liu, Y.H., Ma, D.L., Zuo, Y.G., Zheng, H.Y., Wan, K., Jing, Q., Zhao, Y.L., 2013. A new classification of

- nevus of Ota. *Chinese Medical Journal* 126, 3910–3914. doi:10.3760/cma.j.issn.0366-6999.20131211
- Kar, H.K., Gupta, L., 2014. 1064 nm Q switched Nd:YAG laser treatment of nevus of Ota: an Indian open label prospective study of 50 patients. *Indian journal of dermatology, venereology and leprology* 77, 565–70. doi:10.4103/0378-6323.84057
- Kumari, R., Thappa, D.M. 2006. Familial nevus of ota. *Indian J Dermatol*; 52: 198-9.
- Kunachak, S., Kunachakr, S., Sirikulchayanonta, V., Leelaudomniti, P., 1996. Dermabrasion is an effective treatment for acquired bilateral nevus of Ota-like macules. *Dermatologic Surgery* 22, 559–562. doi:10.1111/j.1524-4725.1996.tb00374.x
- Lapeere, H. 2012. Hypomelanoses and hypermelanoses In: Goldsmith, L.A., Katz, S.I., Gilchrest, B.A., Paller, A.S, Leffell, D.J., Wolf, K., editors. *Fitzpatrick's dermatology in general medicine*. 8thed. New York: Mc Graw Hill.p. 823.
- Lee, B., You, C.K., Won, H.K., Lee, E.S., 2004. Comparison of characteristics of acquired bilateral nevus of Ota-like macules and nevus of Ota according to therapeutic outcome. *Journal of Korean Medical Science* 19, 554–559. doi:10.3346/jkms.2004.19.4.554.
- Lee, W.J., Han, S.S., Chang, S.E., Lee, M.W., Choi, J.H., Moon, K.C., Koh, J.K., 2009. Q-switched Nd:YAG laser therapy of acquired bilateral nevus of Ota-like macules. *Annals of Dermatology* 21, 255–260. doi:10.5021/ad.2009.21.3.255
- Mehta, V., Balachandran, C. 2007. Case report : bilateral nevus of ota. *J Pakistan Association Dermatol*; 17: 59-61.
- Murakami, F., Baba, T., Mizoguchi, M. 2000. Ultraviolet-induced generalized acquired dermal melanocytosis with numerous melanophages. *Br J Dermatol*;142:184-6
- Park, J.M., Tsao, H., Tsao, S., 2009. Acquired bilateral nevus of Ota-like macules (Hori nevus): Etiologic and therapeutic considerations. *Journal of the American Academy of Dermatology*. doi:10.1016/j.jaad.2008.10.054.
- Sakamoto, F.H., Jalian, H.R., Anderson, R.R. 2013. Understanding lasers, lights, and tissue interactions In: Hruza, G., Avram, M., editors. *Lasers and lights*. 3rd Ed. New York: Elsevier.p. 6-8.
- Sharan S, Grigg JR, Billson FA. Bilateral nevus of Ota with choroidal melanoma and diffuse retinal pigmentation in a dark skinned person. *Br J Ophthalmol* 2005; 89: 1529. Sharan, S., Grigg, J.R., Billson, F.A., 2005. Bilateral naevus of Ota with choroidal melanoma and diffuse retinal pigmentation in a dark skinned person [1]. *British Journal of Ophthalmology*. doi:10.1136/bjo.2005.070839
- Tian, B.C.A., 2015. Novel treatment of Hori's nevus: A combination of fractional nonablative 2,940-nm Er:YAG and low-fluence 1,064-nm Q-switched Nd:YAG laser. *Journal of Cutaneous and Aesthetic Surgery* 8, 227. doi:10.4103/0974-2077.172198
- Watanabe S. 2014. Facial Dermal Melanocytosis. *Austin J Dermatolog*; 1(2):1-6