HORI NEVUS

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ABSTRACT

Acquired bilateral nevus of Ota-like macules, commonly referred to as "Hori nevus," is a facial hyperpigmentation condition prevalent among Asian women. This condition is characterized by speckled brown to gray-blue hyperpigmented macules that symmetrically appear on both cheeks, often resembling freckles, lentigines or melasma. Traditional treatments, including depigmentation drugs, cryotherapy, dermabrasion, and peels, have generally showed less effective and are associated with significant side effects. Recent studies, however, indicate that pigment-selective Q-switched lasers, particularly the Q-switched Nd:YAG 1064 nm laser, offer good treatment outcomes. Nonetheless, practitioners must carefully consider potential side effects, such as post-inflammatory hyperpigmentation and exacerbation of melasma, when selecting appropriate treatment methods for patients.

Keywords: *Hori's nevus, acquired bilateral nevus of Ota-like macules, ABNOM, hyperpigmentation, laser pigmentation*

1. INTRODUCTION

Hori's nevus is a common pigment disorder found among Asian women, including in Vietnam. It is characterized by bluish to gray pigmented spots on the face, symmetrically distributed, and histopathologically seen as diffuse pigmentation in the dermis. Hori's nevus is often mistaken for other facial hyperpigmentation conditions such as freckles, age spots, or melasma by both patients and physicians. Analyzing its clinical and histopathological characteristics can help differentiate Hori's nevus from other lesions, enabling appropriate treatment and prognosis.

2. HISTORY

Hori's nevus was first described by Dr. Hori and colleagues in 1984 in the Journal of the American Academy of Dermatology. The condition was observed in 22 Japanese women, manifesting as blue-brown spots on the face (forehead, cheeks, eyelids, nose), without mucosal involvement, appearing in middle age, and resembling Ota's nevus, Riehl's melanosis, or melasma. Dr. Hori's team referred to it as "Acquired, Bilateral, Symmetrical Ota-like Macules" (ABNOM)[1]. In 1987, Sun and colleagues reported a similar condition in 110 Chinese women,

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naming it "nevus fusco-caeruleus zygomaticus" (blue nevus of the zygomatic region). To simplify the term, Asian dermatologists commonly refer to it as Hori's nevus in scientific reports. Today, the most widely used term in medical literature for this condition is ABNOM.[2]

3. EPIDEMIOLOGY

Hori's nevus has mainly been reported in Asia: Japan, Korea, Taiwan, Hong Kong, Thailand, and Singapore. It is rare in Western and African populations, hence it is seldom mentioned in their medical literature. Sun et al. reported a prevalence of 0.8% in Taiwan, with a higher incidence in women. In China, the prevalence is 2.5% among the population and 4.2% in women.[3] In Japan, it accounts for 7.5% of cosmetic skin issues. More than 90% of cases are in women, typically appearing around age 30. However, cases in children have also been reported. Family history plays a role in 6.7% to 41.6% of cases. Although Hori's nevus is a common facial pigment disorder in Vietnam, precise prevalence statistics are unavailable.[3-5]

Risk factors include age, oral contraceptive use, pregnancy, and sun exposure, all of which are independently associated with the condition. It peaks between the ages of 45 and 55, and is rare (1%) in individuals under 25 or over 75. Sun exposure and oral contraceptives double the risk in women. Interestingly, women with seborrheic keratosis on the face have a lower incidence of Hori's nevus.[3]

4. PATHOGENESIS

The exact pathogenesis is still unclear, but there are several hypotheses based on similar skin lesions. Hori and colleagues suggested that misplaced melanocytes might be reactivated due to faulty migration during embryonic development. Currently, the "two-hit" hypothesis is most widely accepted: first, there is a distribution of inactive melanocytes during fetal development, which are later activated by triggers such as UV radiation, sex hormones, chronic inflammation, or other unknown factors[1,4].

Unlike Mongolian spots, which tend to fade over time, Hori's nevus persists. This could be due to a protective extracellular matrix surrounding dermal melanocytes, which thickens with age. Genetic factors may also play a significant role, as the condition is far more prevalent among Asians and is often seen in families[4].

5. CLINICAL PRESENTATION

Hori often appears in women over 30 years old. The skin lesions are multiple hyperpigmented spots resembling freckles, with blue-brown and/or slate-gray, blue-gray coloration, symmetrically located on both cheeks (Figure 1-a). The number of lesions varies between 6 to 24 on the cheeks, with some forming patches. Lesions are less common on the forehead, upper eyelids, and nose, typically with a blue-gray color resembling Mongolian spots rather than freckles compared to the cheeks (Figure 1-b). There are no lesions on the conjunctiva, nasal, or oral mucosa. Extra-facial lesions are rare but can occur on the back, thighs, or limbs. The condition may be associated with other pigmentation disorders such as melasma, freckles, or Ota nevus. The color of the lesions usually changes little over time, though in women, it may turn more blue-gray, does not fade on its own, but can improve with the application of whitening creams. Lesions may darken during pregnancy and are less affected by sun exposure

or contraceptive use. In men, lesions also commonly appear on the cheeks; however, the incidence on the forehead is higher than in women, and the lesions tend to turn blue-gray less often than in women[2,4,6].

Figure 1. Clinical images of Hori's Nevus. a: Symmetrical brown hyperpigmented macules on both cheeks. b: Gray-blue macule on a male patient

6. LABORATORY FEATURES

Dermoscopy: Shows a speckled homogeneous pattern of pigmentation, with no involvement of hair follicles or sweat glands. The pigmentation is blue-brown and/or gray (Figure 2-a). Histopathology: The epidermis appears normal. The characteristics of Hori nevus are primarily found in the superficial dermis, where elongated pigment-bearing cells are dispersed among the collagen fibers, especially in the papillary dermis. These cells align parallel to the collagen fibers and do not disrupt the skin structure. The pigment-bearing cells contain dopa-positive granules and numerous individual melanosomes, with a diameter of about 0.3x0.5 μm^2, surrounded by an extracellular sheath (Figure 2-b).

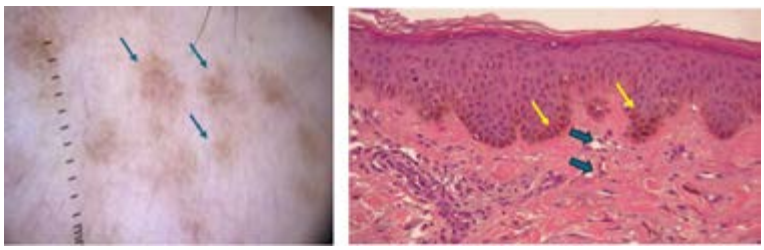

Figure 2. Dermoscopy and histopathological features of Hori's Nevus. a: Speckled homogeneous blue-brown pigmentation. b: Pigmentation at the basement membrane (yellow arrow) and pigment cells and macrophages in the dermis (blue arrow)

7. DIAGNOSIS

The diagnosis of Hori's nevus is primarily based on clinical presentation and dermoscopy findings. The skin lesions typically appear as gray-brown or blue-gray macules, speckled, symmetrical on both sides, often located on the cheeks, and commonly seen in women over 30. Dermoscopy reveals evenly distributed speckled pigmentation, blue-brown or gray, without involvement of hair follicles or sweat glands. Histopathological examination is rarely needed, except in difficult cases requiring differential diagnosis.

8. DIFFERENTIAL DIAGNOSIS

Post-inflammatory hyperpigmentation (PIH): Hyperpigmented macules that appear after inflammatory skin conditions, external irritations, or skin procedures. These lesions typically last a few months to years and may resolve without treatment (Figure 3-a).

Freckles: Small brown pigmented spots, well-defined, 1 - 5 mm in size, symmetrically distributed, typically found on sun-exposed areas like the nose, cheeks, shoulders, and upper back. They become more pronounced with sun exposure and have a hereditary component, common in individuals with lighter skin types (Figure 3-b).

Lentigines (age spots): Common in older adults, these well-defined, round/oval or irregular hyperpigmented macules vary in size, from a few millimeters to centimeters. They range in color from skin-toned to dark brown or black and are commonly found in sun-exposed areas, such as the face and the backs of the hands (Figure 3-c). On dermoscopy, lentigines show a clear border with irregular scalloped edges, creating a "moth-eaten" appearance.

Melasma: Brown to dark brown or blue-black hyperpigmented macules with irregular borders, typically symmetrical, commonly located on the cheeks, temples, forehead, nose, and chin, occasionally seen on the upper arms (Figure 3-d). Dermoscopy shows a homogeneous pigment network of brown or irregular blue-gray patches with telangiectasia. Histology reveals increased pigmentation in the epidermis and dermis with normal or slightly increased melanocyte count and pigment-laden macrophages in the dermis.

Bilateral Ota's Nevus: Appearing early in life or during adolescence, this presents as blue-black or gray-black macules, distributed in areas innervated by the V1 and V2 branches of the trigeminal nerve, such as the forehead, temples, cheeks, and around the eyes. Mucosal involvement (eyes, mouth, nose, tympanic membrane) may occur (Figure 3-e). Histology shows an increase in melanocytes throughout the superficial and deep dermis.

Riehl's Melanosis: Diffuse hyperpigmented patches with a satellite-like pattern around hair follicles, forming a pseudo-reticular pigmentation at the center. Frequently seen on the forehead, cheeks, and temples, it may also affect other areas such as the ears, neck, chest, and arms, though with lighter pigmentation (Figure 3-f).[9] It is often linked to chemical exposure and may present with erythema, edema, scaling, and itching before pigmentation occurs. Dermoscopy shows a pseudo-reticular hyperpigmented structure with gray dots or granules and telangiectasia. Histology shows surface dermatitis (interface dermatitis).

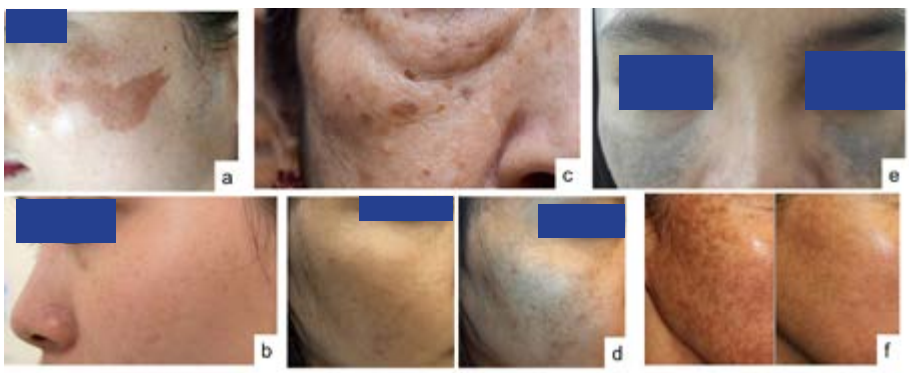

Figure 3. Differential pigmented lesions with Hori's Nevus. a: Post-inflammatory hyperpigmentation showing Koebner phenomenon. b: Freckles. c: Solar lentigines. d: Melasma observed under normal light and Wood's lamp. e: Bilateral Ota's nevus. f: Riehl's pigmentary disorder

9. TREATMENT

Previously, various classic treatments were used, such as chemical peels, dermabrasion, cryotherapy, and topical bleaching agents. For dermal hyperpigmentation like Hori's nevus, chemical peels are ineffective. Dermabrasion and cryotherapy also show poor results due to scarring or skin structure changes from damaging the basement membrane. Bleaching agents can temporarily lighten the lesions but generally do not produce satisfactory results.

Due to the success of selective pigment-targeting lasers in treating Ota's nevus (which has similar histology), laser treatment has become widely used for Hori's nevus. Three types of short-pulse pigment-selective lasers are commonly employed: Q-switched Ruby laser (694 nm), Q-switched Alexandrite laser (755 nm), and Q-switched neodymium (Nd:YAG và KTP) laser (1064 nm, 532 nm). "Q-switched" refers to lasers emitting ultra-high power (10^9W) pulses with very short durations. These lasers store a large amount of energy in the laser cavity and release it all at once. Short-wavelength Q-switched lasers are highly effective for treating dermal pigmentation without altering skin structure or causing depigmentation. The first-line choice is the Nd:YAD laser at 1064 nm.

Laser Q-switched Nd:YAD 1064 nm: Studies have shown that this laser can be used with high or low energy levels. High energy (8 - 10 J/cm^2) showed excellent responses in 28 - 40% of patients after an average of 5.3 - 6.5 treatments, though there was a high rate of post-inflammatory hyperpigmentation (PIH) (up to 50%) . Low energy (2 - 6 J/cm^2) achieved a 45% excellent response rate, similar to high energy levels, but required more treatments (10 - 15 sessions) without PIH side effects (Figure 4). Combining 1064nm and 532nm wavelengths resulted in 100% of patients showing excellent improvement after at least three treatments, although transient PIH occurred in 30% of patients[10-12,14].

Figure 4. Treatment results of Hori's Nevus with Q-switched Nd:YAD 1064nm. a: Before treatment. b: After 7 treatment sessions

Laser Q-switched Alexandrite 755nm: After an average of 7 or more treatments, the response rate of 100% was achieved in 34.4% of patients, while 37% to 100% had a "very good" response (≥ 75% improvement), depending on the study. Post-laser hypopigmentation occurred in 50% of patients, and PIH was seen in 12.5%. Treatment outcomes were comparable whether using low energy with a 4 mm spot size or high energy with a 3 mm spot size. Compared to picosecond pulse lasers, picosecond Alexandrite lasers provided better results with less pain and a lower rate of PIH[15].

Laser Q-switched Ruby 694nm: Research by Zeng et al. demonstrated that the Ruby laser provides faster results (2 - 6 treatments) compared to the Nd:YAD (4 - 12 treatments) and Alexandrite (4 - 6 treatments). However, it carries a higher risk of pigmentation disorders. Prolonged PIH is a key side effect, which should be carefully weighed against the benefits of treatment. This may be attributed to the highest melanin absorption at the 694 nm wavelength, though the penetration depth of Alexandrite and Nd:YAD lasers is greater[16].

Combination laser therapy: Combining non-ablative fractional Er:YAD laser (2940 nm) with low-energy Q-switched Nd:YAD (1064 nm) yielded excellent results in 100% of patients after 2 - 3 sessions. The synergy of these lasers at low energy levels provided significant improvements without increasing side effects. Picosecond Alexandrite lasers showed a "very good" response in 76.7% of patients, with PIH in 27.77% lasting 1.32 ± 0.73 months. Combining Er:YAD and Nd:YAD may offer results comparable to picosecond Alexandrite lasers with fewer side effects, although further research with larger sample sizes is needed[15].

Side effects and influencing factors: Post-inflammatory hyperpigmentation (PIH): PIH is common after laser treatments, but it can gradually improve after 1 - 4 weeks. PIH rates vary from 30 - 100%, though some studies report lower rates of 0-5% . The risk is higher with Ruby lasers and high-energy Nd:YAD lasers. Manuskiatti et al. found that using cold air during laser treatment increased PIH risk compared to no cooling . In a split-face study on 21 Thai patients, PIH was more frequent on the side treated with cold air (62%) than the side without (24%). Combining topical betamethasone with antibiotics did not show significant PIH prevention benefits . The key to reducing PIH is selecting the appropriate laser, diligent sun protection, and potentially short-term use of 4% hydroquinone. Risk of aggravating melasma: Wang et al. studied 1,268 patients and found a 27% incidence of new melasma and 89.5% worsening of existing melasma after Q-switched Nd:YAD laser treatment for Hori's nevus. This risk was higher in patients over 35 years old, with Hori's lesions under 10cm^2, lighter-colored lesions, and Fitzpatrick skin type IV[17].

10. CONCLUSIONS

Currently, Hori's nevus is receiving increasing attention from Asian dermatologists, as it is a common form of hyperpigmentation in women over the age of 30. However, the understanding of the disease's pathogenesis remains limited, primarily based on hypotheses regarding the origin of pigment cells. The leading treatment method today is selective pigment lasers, with the most common being the Q-switched Nd:YAD 1064nm laser. However, many studies still report a relatively high rate of side effects. In the future, more in-depth research on the pathogenesis, along with robust, controlled clinical studies, is needed to comprehensively evaluate different treatment methods.

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