

Review on Acquired Bilateral Nevus of Ota-Like Macules

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ABSTRACT

Acquired bilateral nevus of Ota-like macules is a common pigmentary condition affecting Oriental women in particular. It is often mistaken as freckles, lentigines or melasma by both the laypersons as well as by medical doctors. However, it has distinct clinical features as well as typical histological findings that should distinguish it easily from other facial pigmentary problems. Previous treatment modalities including depigmentary agents, cryotherapy, and chemical peeling has been unsatisfactory. Recent studies reported satisfactory response to dermabrasion and various Q-switched pigment lasers, and long term follow up do not show recurrence of the lesions.

Keywords: *Acquired bilateral nevus of Ota-like macules, laser treatment, Q-switched laser*

INTRODUCTION

Nomenclature

This pigmentary disorder is known by different names in various literatures. They are listed out here to avoid confusion.

1. Acquired bilateral nevus of Ota-like macules (ABNOM)^{1, 3, 10-13}
2. Nevus fusco-caeruleus zygomaticus^{2, 4}
3. Hori's nevus^{5, 10, 12, 14}
4. Acquired circumscribed dermal facial melanocytosis⁵
5. In Taiwan, it is known as 褐藍色顴痣, which is translated from "nevus fusco-caeruleus zygomaticus", and in short as 顴痣
6. The translation of acquired bilateral nevus of Ota-like macules in Chinese is 獲得性對稱性太田痣樣斑
7. The term in Chinese for Hori's Nevus is 崛之痣

Definition

This is an acquired pigmentary disorder characterized clinically by speckled or confluent brownish blue or slate gray pigmentation over the face, and histologically by diffuse upper dermal melanocytosis. The sites involved include the malar

regions, the temples, the root of the nose, the alae nasi, the eyelids and the forehead. One or more sites may be involved. Unlike Nevus of Ota, the pigmentation occurs bilaterally and symmetrically, has a late onset in adulthood, and does not involve the mucosa. It is described only in the Orientals and is much more common in females.

History

Hori et al.¹ first described this condition in 1984 as "acquired bilateral nevus of Ota-like macules" in 22 middle-aged Japanese women. Sun et al.² reported similar condition in 110 Chinese in 1987, and he coined the term "nevus fusco-caeruleus zygomaticus" to describe the condition. As all of these terms suffer from verbosity, Asian dermatologists tend to use the term Hori's nevus in academic meetings, and the term was mentioned in various literatures.^{5, 10, 12, 14} It seems the most popular term used in literature is acquired bilateral nevus of Ota-like macules (ABNOM).^{1, 3, 10-13}

EPIDEMIOLOGY

A large scale population study was carried out by Sun et al.² in 1987 to determine the prevalence of the condition in Chinese in Taiwan. A total of 2677 people were examined and found an overall incidence of 0.8%. There was a marked female preponderance. The male to female ratio was 1:6. The incidence in female alone was 1.2%, but was as high as 2.4% in a group of population of 426 female with a mean age of 32 years.

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The condition has been described only in the Orientals in Japan, Taiwan, Thailand, Hong Kong, and Singapore etc. It must be very rare in the Westerners or Negroes, as ABNOM has not been mentioned in any literature on such ethnic groups, although acquired circumscribed dermal melanocytosis of some other sites has been described.

There is some controversy regarding the age of onset. Hori's¹ paper mentioned that the condition usually appeared in the fourth and fifth decade in Japanese women. Sun's² series gave a different picture in that appearance of the nevus was rare before the age of 10 years, but occurred between the ages of 11 and 35 years in 74.5% of the cases. In 94.5% of the cases onset was after the age of 11 and in 60% after the age of 21. In the series of 34 patients by M. Mizoguchi et al,⁹ two third of the patients first noted the pigmentation between the age of 8 and 25 years and the age at the first visit ranged from 21 to 66 years and the average 40.8±10.7 years.

CLINICAL FEATURES

The lesions consist of asymptomatic speckled macules over the malar regions of both cheeks, symmetrical, bilateral, with a mixed hue of brown, slate-gray, blue-black color. The number of spots on each malar region varies from 15±9 in Sun's series.² Some of the guttate macules may coalesce to form a large macule. Those over the temples, forehead, and alae nasi are often homogeneous and slate gray in color, and appear as large confluent macules like Mongolian spots rather than in a speckled pattern.

In many cases, more than one anatomical site is involved. In order of frequency, the various sites involved are zygomatic regions (96.4%), alae nasi (35.7%), root of nose (25%), temples (17.8%), upper eyelids (3.5%) respectively in a small series of 28 cases by M. Mizoguchi et al.⁹ Pigmentation does not disappear with time, but may become lighter in colour temporarily with depigmentary agents. Unlike nevus of Ota, there is no involvement of the conjunctiva, the buccal mucosa, or the palatal mucosa.

The onset of the pigmentation is usually in the twenties. The pigmentation tends to get darker with

pregnancy. The relation with sunshine and contraceptive pill is less obvious.

HISTOPATHOLOGY AND ELECTRON MICROSCOPY

The epidermis appears normal. The main changes are in the upper dermis. There are elongated, slender pigment-bearing cells dispersed between the collagen fibers of the dermis, particularly in the subpapillary dermis. Their long axis is along the collagen fibers and does not disturb the normal architecture of the skin. Dopa positive granules are seen in the pigment bearing cells.² In nevus of Ota, dermal melanocytes are seen to involve the deeper reticular dermis as well.¹⁰

The pigment bearing cells contain many singly dispersed melanosomes in stage II, III, IV of melanization. These structures are 0.3x0.5 μm^2 in diameter and are surrounded by an extracellular sheath. These pigment bearing cells are identified as actively melanin-synthesizing dermal melanocytes.¹

PATHOGENESIS

The pathogenesis of this condition is unknown, but several theories have been put forward. These include (a) dropping off of epidermal melanocytes; (b) migration of hair bulb melanocytes; (c) reactivation of pre-existing latent dermal melanocytes, which are triggered by dermal inflammation, UV radiation, or hormonal changes in pregnancy.¹

The last theory is supported by several observations: (a) no recurrence observed after successful treatment; (b) Mizoguchi et al.⁹ found active melanocytes as well as non-pigmented immature melanocytes in the dermis of the lesion, and confirmed in vitro that endothelin-1, which was produced and secreted by keratinocytes after UV-irradiation affected melanocytes and accelerated melanogenesis; (c) Mizushima et al⁷ reported two cases in which dormant melanocytes were detected in the dermis in the skin 2 cm away from the clinically pigmented lesions; (d) Murakama et al⁶ studied the normal skin of seven Japanese subjects and found a small number of immature melanocytes were present in the

dermis; (e) UV/PUVA-induced dermal melanocytosis were reported by various investigators.⁸

DIFFERENTIAL DIAGNOSIS

The differential diagnoses include freckles, lentiginos, melasma, post inflammatory hyperpigmentation, pigmentary incontinence due to various causes, Riehl's melanosis and bilateral nevus of Ota. The lesions are often mistaken as freckles by both the patients and the clinicians. Oriental patients in the thirties often present with a mixed picture of lentiginos, freckles, melasma, post-inflammatory hyperpigmentation and Hori's nevus, which often confuse the less experienced dermatologists. Even the most experienced dermatologists may have difficulty telling the exact nature of some of the individual pigmented spots clinically. Confusion also arises as occasional dermatologists called the lesions dermal melasma. The lesions could be difficult to differentiate from true bilateral nevus of Ota, but the history tells that the latter has a much earlier onset. Typical cases usually pose no diagnostic problem to the clinician, as in several studies, most cases were diagnosed clinically.^{2, 9, 11-14}

TREATMENT

Lesions of dermal melanocytosis do not respond to chemical peeling, as the lesional melanocytes locate in the dermis. Cryotherapy has been used to treat nevus of Ota, but often induces scarring and significant pigmentary or textural changes, and the degree of pigmentation clearance is not satisfactory. Treatment with depigmentary agents may slightly lighten the pigmentation temporarily, but never to a significant extent as to be satisfactory to the patient.

Dermabrasion

The first literature on the treatment of ABNOM was the use of dermabrasion by Kunachak et al.¹¹ in 1996. From 1987 to 1994, 320 patients with ABNOM were included in the study. Area dermabrasion using a hand engine with a coarse diamond fraise was performed in every case. The end point of the procedure was determined either by complete clearance of pigments observed visually, or when one reached the middle or

approached the lower dermis layer, even though there were residual pigments.

According to the study, 310 patients (97%) achieved 100% clearance of the pigment. In the remaining 10 patients (3%) there was 5% residual pigment. The wound healed with excellent cosmesis, and without changed skin texture. Postoperative complication included hyperpigmentation, which appeared during the first 3 months after the operation, and responded readily to topical hydroquinone. Another complication was erythema of the treated area, which took 6 months to return to normal. There was no recurrence at 1-7 years of follow up.

The authors claimed that dermabrasion was a safe, cheap, fast and effective means for the treatment of ABNOM and concluded that an excellent response and cosmesis could be obtained after a single session. However in 1999, the same authors Kunachak et al¹² commented that dermabrasion, though a promising approach was considered an invasive procedure. If it was used to eradicate a particularly deep-seated lesion, it might lead to undesirable textural or pigmentary changes.

Q-switched ruby laser

In 1999, Kunachak et al.¹² reported 140 patients treated with Q-switched ruby laser. The laser fluence employed was 7-10 Joules/cm², at a repetition rate of 1 Hz, and a spot size of 2-4 mm. The fluence adjustment was determined by tissue reaction. They used the highest fluence that would turn the treated site uniformly white, without bleeding or immediate epithelium sloughing. The next treatment session was scheduled as soon as the scabs had fallen off or before repigmentation occurred, usually within 1-6 weeks (mean 2.2 weeks) of the previous session. The end point of treatment was a total disappearance of pigment. The number of treatment sessions ranged from 1 to 6 (mean 2.3). Of the 131 patients who completed the treatment, complete clearance was obtained. Temporary hyperpigmentation was observed in 10 patients (7%) and readily responded to 4% topical hydroquinone. Five patients (3.6%) had prolonged hypopigmentation and 3 patients (2.1%) had persistent hypopigmentation. There was no recurrence at 6 months to 4.3 years (mean 2.5 years) of follow up. The authors concluded Q-switched ruby laser was an

effective and less invasive (than dermabrasion) tool to eradicate ABNOM.

Q-switched Nd-YAG laser

It was interesting to note that there were 2 papers published in 2000 on the treatment of ABNOM by Q-switched Nd-YAG laser with different results and conclusion. The first paper was by Kunachak et al.¹³ (K's) and the other one by Polnikorn et al.¹⁴ (P's). In K's paper, of all the 68 patients who completed the treatment, 100% patients attained 100% lesional clearance after 2-5 treatment sessions (mean, 2.8 sessions). In P's paper, they concluded that only 50% of patients who underwent three or more treatments (6 out of 12 cases) showed good to excellent results (>50% to >75%). In both series, there was a high incidence of post inflammatory hyperpigmentation (PIH) after laser treatment, up to 50% and 73% respectively in K's and P's paper. Both authors used topical hydroquinone to treat the PIH. It was interesting to note that in K's series, not only their patients responded better to laser treatment, even their PIH responded much faster in a few days to weeks. In P's series, up to 40% of their patients had persistent PIH requiring over 3 months to resolve. The two series also differed in several ways regarding the treatment methods. K's series used a laser with pulse width of 25 nsec, fluence of 8-10 J/cm², 2-4 mm (mostly 4 mm) spot size and 10 Hz. Treatment interval was scheduled at 2 or 3 weeks after the previous session. Topical hydroquinone was prescribed to patients with PIH and the next treatment was postponed till PIH had resolved. P's series used a laser with pulse width of 6-8 nsec, a significantly lower fluence of 4-6 J/cm², 3 mm spot size and 10 Hz. Treatment intervals ranged from 3-6 months depending on the duration of PIH. Topical hydroquinone 2-6% was prescribed to patients with PIH. The Q-S 532 nm wavelength was also used in P's series when there was epidermal pigmentation.

DISCUSSION

In the three series by Kunachak et al,¹¹⁻¹³ whether the patients be treated by dermabrasion, Q-switched Ruby laser or Q-switched Nd:YAG laser, excellent results were obtained in 97-100% of patients, and the complication was limited to hypopigmentation in a small percentage of up to 3% of cases. Though hyperpigmentation was common in their series, they all

responded readily to depigmentary agents. It seems that not only their ABNOM responded particularly well to all form of their treatments, their complications also had a lower incidence and responded more readily to adjunctive measures. These impressive results however have not been confirmed by other studies.

In the series by Polnikorn et al.¹⁴ the result was less impressive. This may be due to several reasons, including the small number of treatment sessions (82% treated with 1-2 sessions only), prolonged treatment interval of 3-6 months, and a much lower laser fluence of 4-6 Joules/cm². In P's opinion, the response of ABNOM to laser treatment was less impressive than that of Ota's nevus. This conclusion was different from other workers.

Another controversial point was raised by R. Geronemus¹² who commented on Kunachak's unique therapeutic approach in the management of these patients in the sense that repetitive treatment sessions were performed at short intervals which differed significantly from other therapeutic regimens in published series with the use of ruby laser. He quoted one reference from Taylor et al who noted benefit from delayed treatments as significant lightening can sometimes be seen many months after initial treatment session.

Suggestions for further studies

In view of these uncertainties and controversies, it may be helpful to perform the following studies:

- 1) To perform controlled trial on patients treating one side as frequently as possible as mentioned by the above authors and the other side at 3 monthly interval and compare the number of treatment sessions required for complete clearance.
- 2) To perform controlled trial of patients treating one side with laser supplemented with depigmentary agents as mentioned above, and the other side without, and compare the degree of improvement on both sides.
- 3) To compare the response to treatment to different type of lasers on the same patient, say, treating one side with Q-S Nd:YAG, and the other side with Q-S Alexandrite laser.
- 4) To see if the treatment interval and the use of bleaching agents has any significance on the development of hypopigmentation as the complication.

Hopefully, a clearer picture can be obtained with regard to the treatment of this condition after further well-designed studies.

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