Case Report

Exogenous Ochronosis: Screening by Dermoscopy and Histopathological Confirmation

Melyawati Hermawan, Irma Bernadette Simbolon Sitohang[1], Sondang Pandjaitan Sirait[1]

Department of Dermatology and Venereology, Atma Jaya Catholic University of Indonesia, [1]Department of Dermatology and Venereology, Universitas Indonesia, Jakarta, Indonesia

Abstract

A 51-year-old female presented with a 10-year history of brownish skin marks on her cheeks. Dermatological examination showed malar brownish macular lesions with diffused reddish areas and superimposing brownish papules. Further dermoscopic examination showed short circinate brownish-red structures and cutaneous pseudo-rete accentuation. Histopathological examination confirmed Stage II exogenous ochronosis (EO). Hydroquinone is the most commonly used topical agent for hyperpigmentation skin disorders. One side effect of its long-term use is EO. Clinically, EO is difficult to diagnose, and clinicians should be more aware of this condition. Dermoscopy is an *in vivo* diagnostic tool that is used to enhance the visualization of cutaneous lesions. The use of this device can potentially assist in identifying the progress of melasma disorder into EO.

Keywords: Dermoscopy, exogenous ochronosis, pathology

Introduction

Melasma is a hyperpigmentation skin disorder commonly found in Asia. Ochronosis, on the other hand, is rarely found or reported. There are two forms of ochronosis, namely endogenous and exogenous. Endogenous ochronosis is caused by a recessive autosomal metabolic disorder that results in the accumulation of homogentisic acid in the collagen tissue. However, exogenous ochronosis (EO) can result from the use of products containing hydroquinone, resorcinol, phenol, mercury, picric acid, or oral antimalarial drugs.[1,2]

Predisposition factors of EO are, among others, Fitzpatrick skin types IV–VI, lack of sun protection, skin irritation, and the use of hydroquinone at concentrations of >3% for more than 6 months.[2] EO clinically presents as diffuse hyperpigmented brownish-gray or blackish-blue lesions distributed across the face, neck, posterior of the trunk, and extensor surfaces of the extremities.[1,3]

The clinical diagnosis of EO is difficult. It can be differentiated from other hyperpigmented lesions based on histopathological examinations showing the characteristic ochre (yellow-brown) banana-shaped collagen fibers in the papillary dermis layer.[3] Recently, dermoscopy has been used as a supporting diagnostic tool for various skin disorders.[4,5]

Access this article online

Quick Response Code:

Website: www.jnsbm.org

DOI: 10.4103/jnsbm.JNSBM_74_19

This report describes the use of dermoscopy to assist in screening for EO to prevent the worsening of skin lesions. Early identification is important for the prompt cessation of the use of the agents causing the disorder, as therapy for the advanced stage of the condition does not give as beneficial a result.

Case Report

A 51-year-old female with Fitzpatrick skin Type IV presented with a 10-year history of brownish skin marks on her cheeks. She had previously attempted to remove the brownish marks using various skin-whitening topical agents, which she acquired from various esthetic clinics or dermatologists. She was also administered a morning cream but was given no information about its sunscreen properties. Although there was initial improvement, over the past 2 months before presentation, she complained that the brownish marks had worsened despite the use of the skin-whitening agents. She also noted that the marks were becoming increasingly rougher.

Address for correspondence: Dr. Melyawati Hermawan, Jl. Pluit Raya 2, Jakarta 14440, Indonesia.
E-mail: melyawati@atmajaya.ac.id

How to cite this article: Hermawan M, Simbolon Sitohang IB, Sirait SP. Exogenous ochronosis: Screening by dermoscopy and histopathological confirmation. J Nat Sc Biol Med 2019;10:S163-5.

She did not complain of any joint pain or change of color in the urine, sclera, armpits, or genitals. The patient is a full-time housewife of good economic status and was rarely exposed to direct sunlight.

On clinical examination, the patient was found to have bilateral malar brownish macular lesions with adjacent multiple nummular diffused reddish skin areas and superimposed brownish papules [Figure 1]. Further dermoscopic examination showed short circinate brownish-red structures accompanied by the cutaneous pseudo-rete accentuation characteristic of melasma [Figure 2]. Based on the clinical interview, physical examination and dermoscopic findings, it was determined that a skin biopsy should be performed. The histopathological examination confirmed the suspicion of EO, revealing the presence of the typical reddish-orange (ochre) banana-shaped structures in addition to solar elastosis of the upper dermis without the presence of epidermal hyperpigmentation [Figure 3].

Based on the histopathological findings, the diagnosis of EO was confirmed. The patient was advised to stop using whitening cream, and she was prescribed topical tretinoin only for night-time application and sunscreen for morning application.

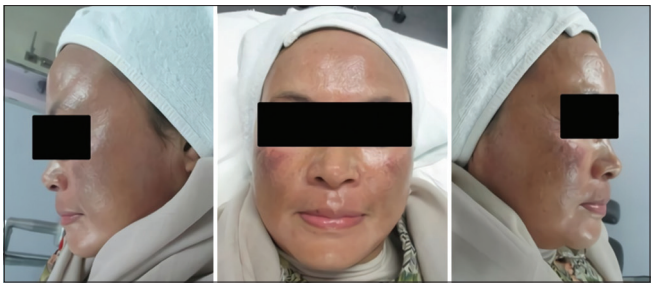

Figure 1: Clinical presentation of exogenous ochronosis in the patient

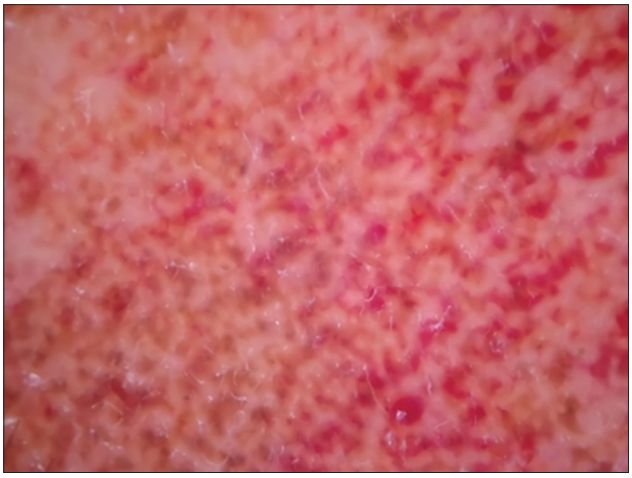

Figure 2: Dermoscopic visualization of the lesion showing short circinate brownish-red structures accompanied by the cutaneous pseudo-rete accentuation characteristic of melasma

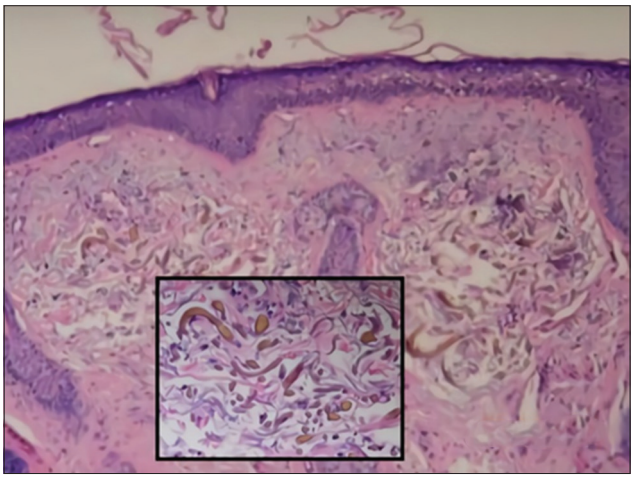

Figure 3: Histopathologic examination showing the typical reddish-orange (ochre) banana-shaped structures along with solar elastosis of the upper dermis without the presence of epidermal hyperpigmentation

Discussion

It is highly likely that there are many more unidentified cases of EO, especially as the use of skin-whitening products is ubiquitous across Asia.[6] In Indonesia, the principal treatment for melasma and other skin hyperpigmentation conditions is topical hydroquinone. Unfortunately, in addition to being available by prescription, this topical agent is also readily available in the market.

The reports of EO cases are growing in number, often presenting with a clinical appearance that is hard to distinguish from melasma. In this particular case, the composition of the whitening cream that the patient had been using was unknown. However, considering the prevalent nature of hydroquinone use in Asia, it is highly likely that the whitening cream she had been using contained this agent.

EO appears as blackish-blue macular lesions in areas where the hydroquinone is applied.[7] A lack of awareness about EO and continuous use of hydroquinone could worsen the lesions, but the establishment of an EO diagnosis is not easy. Liu *et al*.[8] suggested a number of clinical features that clinicians can use as clues to consider EO in differentials, including darkening (instead of lightening) hyperpigmented lesions, bluish-gray hyperpigmented lesions, and papules superimposed on hyperpigmented lesions. In this particular patient, all three features were found in the hyperpigmented lesions, combined with her long-term use of whitening cream further developed the suspicion of EO.

Dermoscopy is a diagnostic tool that can be used to enhance the visualization of cutaneous lesions during physical examination. The use of dermoscopy is encouraged as a supporting diagnostic step for hyperpigmented lesions, especially in cases with a history of hydroquinone use. Charlín *et al*.[2] was the first to report on dermoscopic findings for EO lesions. He described the appearance of a gray-blue area obliterating the follicular structures. The dermoscopic appearance of the EO lesion has also been described as having gray-brown

annular and arciform structures.[9] In this particular patient, the dermoscopic examination showed the presence of short circinate brownish-red structures accompanied by the cutaneous pseudo-rete accentuation characteristic of melasma.

The pathogenesis of EO is suspected to be due to the impeded activity of a homogentisate oxidase enzyme, resulting in the accumulation of homogentisic acid, which then polymerizes and forms an ochronotic pigment visible in histopathological examination. Histopathological examination of the patient is all in concordance with EO. According to Dogliotti's classification, the established diagnosis for this patient was determined to be Stage II EO.[10]

EO management is not a simple task. There are multiple therapeutic modalities involved, from topical treatment to the more aggressive laser treatment. However, there has been no single therapeutic modality which has been proven to be consistently satisfying.[11] The cessation of hydroquinone application in EO patients is crucial, and hence, this was the first treatment option taken for this patient. For the hyperpigmentation, the patient was administered topical tretinoin and sunscreen to mitigate any worsening of the hyperpigmented lesions.

Conclusion

It is possible that there are many unidentified cases of EO, especially in Asia where the use of skin-whitening products is ubiquitous. Therefore, clinicians have to develop a higher awareness for this complication of the long-term use of hydroquinone. As melasma lesions are often found together with EO, dermoscopy is expected to help with identifying the progression of melasma disorder into EO.

Declaration of patient consent

The authors declare that the patient has given written permission to use her medical data in the manuscript.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

The 3rd ICE on IMERI committee supported the peer review and manuscript preparation of this article.

Conflicts of interest

There are no conflicts of interest.

References

1. Wolff K, Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffell DJ. Hypomelanoses and hypermelanoses. In: Lapeere H, Boone B, Schepper SD, Verhaeghe E, Ongenae K, Van Geel N, *et al*., editors. Fitzpatrick's Dermatology in General Medicine. 8th ed. New York: McGraw Hill; 2012. p. 804-25.
2. Charlín R, Barcaui CB, Kac BK, Soares DB, Rabello-Fonseca R, Azulay-Abulafia L, *et al*. Hydroquinone-induced exogenous ochronosis: A report of four cases and usefulness of dermoscopy. Int J Dermatol 2008;47:19-23.
3. Ribas J, Cavalcante MS, Schettini AP. Exogenous ochronosis hydroquinone induced: A report of four cases. Anais Bras Dermatol 2010;85:699-703.
4. Lacarrubba F, Verzì AE, Dinotta F, Scavo S, Micali G. Dermatoscopy in inflammatory and infectious skin disorders. G Ital Dermatol Venereol 2015;150:521-31.
5. Errichetti E, Stinco G. Dermoscopy in general dermatology: A practical overview. Dermatol Ther (Heidelb) 2016;6:471-507.
6. Tan SK. Exogenous ochronosis a diagnostic challenge. J Cosmet Dermatol 2010;9:313-7.
7. Baumann L, Alleman IB. Depigmentating agents. In: Baumann L, Weisberg E, editors. Cosmetic Dermatology: Principles and Practice. New York: McGraw-Hill; 2009. p. 279-91.
8. Liu WC, Tey HL, Lee JS, Goh BK. Exogenous ochronosis in a Chinese patient: Use of dermoscopy aids early diagnosis and selection of biopsy site. Singapore Med J 2014;55:e1-3.
9. Mishra SN, Dhurat RS, Deshpande DJ, Nayak CS. Diagnostic utility of dermatoscopy in hydroquinone-induced exogenous ochronosis. Int J Dermatol 2013;52:413-7.
10. Dogliotti M, Leibowitz M. Granulomatous ochronosis--a cosmetic-induced skin disorder in blacks. S Afr Med J 1979;56:757-60.
11. Moioli EK, Bakus AD, Yahmai D, Hernandez C. Treatment strategies for pigmentation disorders in skin of color. Cosm Derm 2011;24:524-30.