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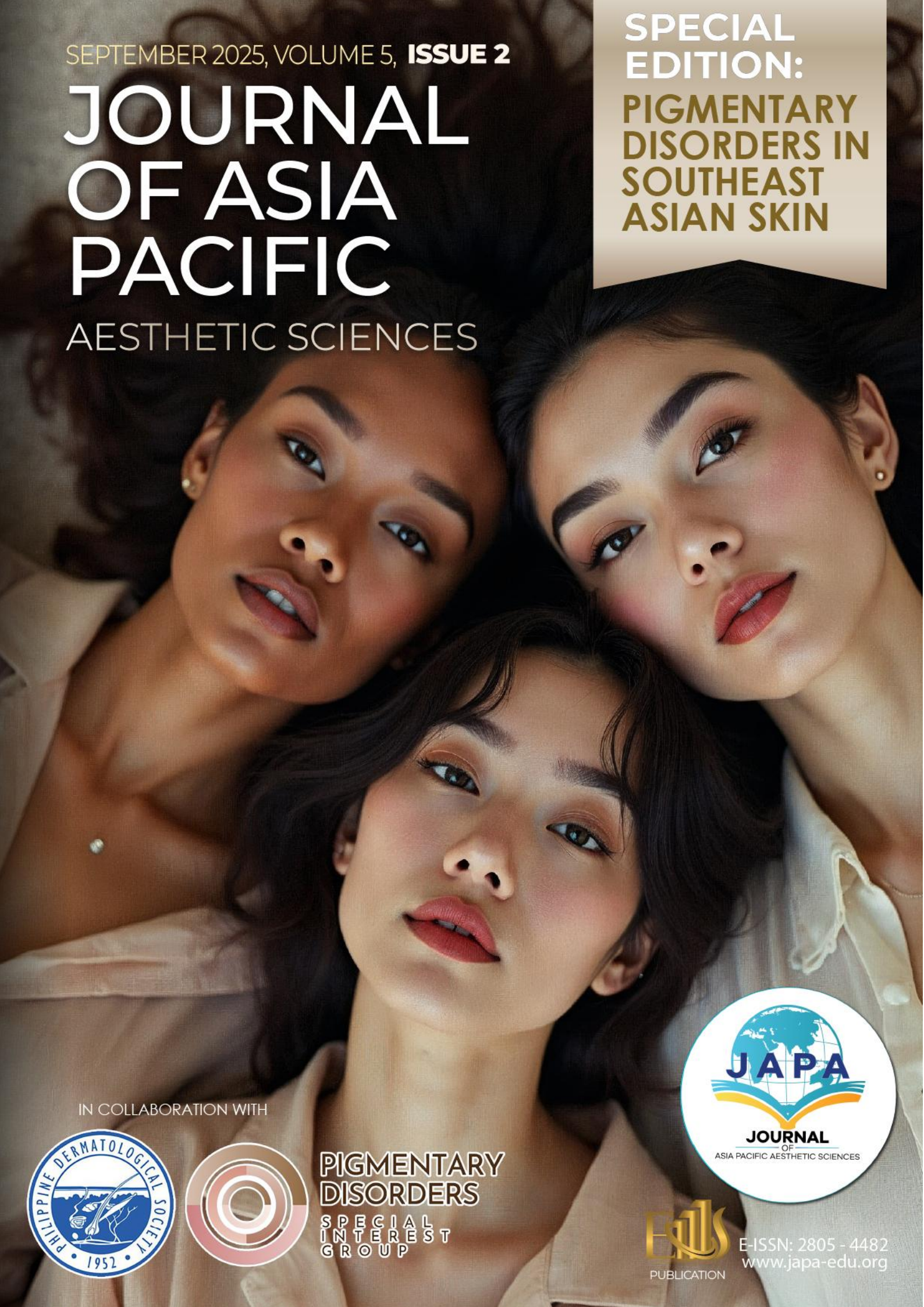

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Pigmentary Disorders in Southeast Asia: A Collaborative Agenda

Bernadette B. Arcilla
Chairperson,
Pigmentary Disorders Special Interest Group,
Philippine Dermatological Society

Pigmentary disorders, which include hyperpigmentation, hypopigmentation, and/or depigmentation, comprise a critical area of dermatologic concern. They may be potentially linked to or provide clues about systemic involvement, underlying health issues, or the significant psychosocial burden experienced by affected individuals. Such conditions can affect all genders, from pediatric to geriatric patients, and in terms of pathophysiology, they encompass genetic components, environmental influences (e.g., sun exposure), as well as internal (e.g., underlying diseases) and external (e.g., medications) contributory factors.

The Pigmentary Disorder Special Interest Group (PDSIG) of the Philippine Dermatological Society (PDS) aims to be at the forefront of increasing awareness and activities for both medical colleagues and patients, as reflected in our PDSIG Mission and Vision:

- **Mission:** To educate fellow dermatologists on the diagnosis and management of various pigmentary disorders by promulgating evidence-based knowledge through research and collaboration with other allied societies.

- **Vision:** To create the Philippine consensus guidelines on the various pigmentary disorders, not limited to melasma and vitiligo.

It is both fortuitous and exciting that PDSIG is able to collaborate with the Journal of Asia Pacific Aesthetic Sciences (JAPA) in this Special Pigmentary Issue for September 2025 to compile and publish articles related to pigmentary disorders.

From the Philippines, this issue features two observational studies and several interesting case reports. In addition, articles and case reports submitted from Malaysia and Indonesia contribute significantly to raising awareness of the high incidence and impact of pigmentary disorders in the Southeast Asian region. These contributions align with the PDSIG's vision to enhance understanding, promote effective management, and improve the lives of individuals affected by pigmentary conditions. Through our valued partnership with esteemed publishers such as JAPA, we hope to further support this vision by providing readers with insightful, evidence-based content that fosters deeper knowledge and guides improved clinical care.

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Challenges in Treating Aesthetic Pigmentary Disorder in Southeast Asia

Assoc. Prof. Dr. Ungku Mohd Shahrin Mohd Zaman,
Editor-in-Chief

Southeast Asia, with its diverse ethnicities, presents a wide range of Fitzpatrick skin types, predominantly types III to V [1]. Compared to Western populations, Southeast Asian skin is generally darker and contains larger amounts of melanin, which provides natural photoprotection [2]. However, despite this benefit, Asian skin shows a higher tendency towards pigmentary disorders [2].

Common pigmentary disorders include epidermal conditions such as lentigines, ephelides, and melasma, and dermal disorders like nevus of Ota and Hori's nevus [2]. Vitiligo and idiopathic guttate hypomelanosis (IGH), are not uncommon [3]. Post-inflammatory hyperpigmentation (PIH), often triggered by acne, laser treatments, or skin injury, is particularly prevalent [2,3]. Hyperpigmented lesions (melasma, PIH, lentigines) appear as dark patches, while hypopigmented conditions (vitiligo, IGH) present as lighter lesions [3].

Among these, melasma is the most common and one of the most challenging to treat [2]. It is an acquired symmetrical hypermelanosis that typically affects photo-exposed areas, with peak incidence between ages 30 and 44 years [2,4]. Prevalence varies, reaching up to 40% in women and 20% in men in Thailand, 4% in Malaysia, and 0.98% in Indonesia [4]. Contributing factors include genetics, UV exposure, pregnancy, hormonal therapy, and phototoxic drugs [2]. Melasma is notoriously difficult to manage due to its multifactorial causes, resistance to treatment, and high recurrence rate [5].

Current treatment strategies include topical therapies (hydroquinone, corticosteroids, tretinoin), chemical peels (salicylic acid, glycolic acid, trichloroacetic acid), and noncytotoxic or laser-based therapies [2,3,6]. However, these approaches face challenges: long treatment durations, high patient commitment, risks of PIH, frequent relapses, and limited efficacy, particularly in Southeast Asian skin [6].

The demand for effective pigmentary disorder treatments continues to grow in Southeast Asia, driven by lighter skin tone preferences and the higher prevalence of melasma [6]. Yet, awareness of pigmentary disorders remains lower compared to Western countries, partly due to socioeconomic barriers and cultural differences in the perception of skin [7,8].

The unique characteristics of Asian skin, with distinct responses and side effects compared to Caucasian skin [9], highlights the need for more region-specific research [2]. A better understanding of Asian skin biology will improve therapeutic selection and enhance clinical management of pigmentary disorders [2]. Effective treatment not only enhances skin appearance but also significantly improves quality of life by reducing self-consciousness, social limitations, and dependence on cosmetic camouflage [3].

This Journal of Asia Pacific Aesthetic Sciences (JAPA) collaborative issue with the Pigmentary Disorder Special Interest Group (PDSIG) of the Philippine Dermatological Society (PDS) seeks to highlight the challenges of treating aesthetic pigmentary disorders in Southeast Asia, particularly in Malaysia and the Philippines. This issue features a range of disorders, novel treatment approaches, and case reports, while acknowledging current limitations. Moving forward, we aim to expand coverage to more Southeast Asian countries and disorders, while exploring innovative treatments with fewer adverse effects.

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ORIGINAL ARTICLE

Dermoscopic Features of Common Hypomelanotic Macular Diseases in a Tertiary Institution: A Descriptive Study

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Abstract: Dermoscopy reveals diagnostic details not discernible to the naked eye. This non-invasive tool is particularly useful in the evaluation of hypomelanotic dermatoses, where subtle pigmentary changes often pose diagnostic challenges. Assessing vascular, pigmentary, and structural features aids in differentiating various hypomelanotic macular conditions. This study aimed to characterize the dermoscopic features of common hypomelanotic skin conditions in a tertiary hospital and to evaluate the diagnostic utility of dermoscopy in reducing reliance on skin biopsies. An observational descriptive study was conducted over three months, involving patients with newly developed hypomelanotic patches and macules. All patients underwent clinical evaluation and dermoscopic examination using a handheld DermLite DL3N. Dermoscopic assessment included evaluation of pigmentation changes, lesion edge definition, scaling, perifollicular and perilesional pigmentation, hair color changes, vascular morphology, and distinctive dermoscopic patterns. The mean age of the patients was 28.82 ± 13.01 years. Of the cohort, 26 (54.2%) were male and 22 (45.8%) were female. Diagnoses included pityriasis versicolor (n=27, 56.3%), vitiligo (n=11, 22.9%), pityriasis alba (n=9, 18.8%), and nevus depigmentosus (n=1, 2.1%). This study highlights dermoscopy as a valuable diagnostic tool for hypomelanotic macular diseases, particularly in resource-limited rural settings with restricted access to histopathology. While not definitive for all hypomelanotic conditions, its integration with clinical evaluation may improves diagnostic accuracy and provides a practical alternative to invasive procedures, supporting its role in standard dermatologic practice.

Keywords: Dermoscopy, Hypopigmented, Vitiligo, Pityriasis versicolor, Pityriasis alba, Nevus depigmentosus

Introduction

Hypomelanotic macular diseases are a common reason for dermatological consultation. Hypomelanosis refers to a significant reduction in melanin levels, resulting in areas of decreased pigmentation compared to normal skin [1], which manifest as white patches of varying sizes. Common hypomelanotic conditions encountered in dermatology practice in the Philippines include vitiligo, pityriasis alba, extragenital lichen sclerosus, achromic pityriasis versicolor, idiopathic guttate hypomelanosis, and nevus depigmentosus.

Although most hypomelanotic skin conditions are benign, cosmetic concerns can lead to social stigma and psychosocial distress, particularly in individuals with darker skin. This often prompts patients to seek medical advice and treatment [1]. Vitiligo, especially when lesions affect exposed areas or involve extensive body surface area, significantly impairs quality of life [2]. Similarly, while pityriasis alba is generally benign and self-limiting, its visibility in darker skin tones may cause emotional distress [3].

Hypomelanotic macular diseases affect individuals across all age groups and frequently present diagnostic challenges due to overlapping clinical features, particularly in early or atypical stages [3]. Diagnosis typically requires a comprehensive dermatologic evaluation, including detailed history-taking, thorough skin examination, and the use of adjunctive diagnostic tools such as Wood's lamp, dermoscopy, laboratory tests, and skin punch biopsy when indicated. While histopathologic examination remains the gold standard, its invasive nature and limited accessibility in some regions of the Philippines highlight the need for alternative diagnostic approaches.

Dermoscopy, also known as dermatoscopy, epiluminescence microscopy, or skin surface microscopy, has become an invaluable tool in the diagnosis of various dermatological disorders [4]. Dermoscopy has proven valuable in the evaluation of scalp and hair diseases, nail-fold abnormalities, inflammatory dermatoses, skin tumors, and melanocytic pigmentary lesions [3]. In hypomelanotic disorders, dermoscopy provides additional visual clues that aid differentiation, assess disease severity, and monitor treatment response. Dermoscopy serves as a practical adjunct to clinical assessment and can be integrated with histopathology to assist dermatologists in evaluating hypomelanotic conditions [5].

Despite growing global recognition of dermoscopy as a rapid, non-invasive, and cost-effective diagnostic tool, its routine use in evaluating hypomelanotic dermatoses remains limited in the Philippines. Similar patterns have been observed in other countries with comparable healthcare settings. For instance, a nationwide survey of Indian dermatologists reported that only 54.7% routinely used dermoscopy, citing barriers such as limited training, high equipment costs, and uncertainty about its diagnostic value [6].

This study aims to analyze the dermoscopic features of common hypomelanotic macular diseases observed in the dermatology outpatient department in the Philippines. It also seeks to evaluate the utility of dermoscopy as an adjunctive tool for the rapid and accurate diagnosis of hypomelanotic skin conditions. Furthermore, the study aims to move beyond the traditional clinico-pathologic correlation of skin diseases to a more comprehensive clinico-dermoscopic-pathologic correlation.

By providing data on characteristic dermoscopic findings of common hypomelanotic disorders, this study may encourage dermatologists to incorporate dermoscopy into routine clinical assessments. Integrating dermoscopic evaluation into standard examinations of patients with pigmentary disorders has the potential to enhance diagnostic accuracy and improve overall patient care.

Methodology

This observational descriptive study was conducted from February to April 2024, at the Outpatient Department of the Research Institute for Tropical Medicine (RITM), Department of Dermatology, Philippines. Patients presenting with hypopigmented macules or patches were recruited after providing informed consent. Patients were eligible if they were 18 years or older, of any sex, and had untreated or newly diagnosed hypomelanotic skin lesions within the past year. Patients who declined to provide informed consent, had previously received treatment for their lesions such as topical medications, phototherapy, or systemic antifungals, and those belonging to vulnerable populations, including individuals unable to provide informed consent or elderly patients with cognitive impairment, were excluded from the study.

The study protocol was reviewed and approved by the RITM Institutional Review Board (RITM-IRB). Each patient was assigned a unique code number to maintain confidentiality. All patients underwent a comprehensive dermatological assessment, which included detailed history-taking and physical examination. Demographic information, including age, sex, socioeconomic status, and relevant clinical findings, was collected and documented.

Dermoscopy Assessment

Dermoscopy was performed on all enrolled patients using a hand-held dermoscope (DermLite DL3N, Italy) at 10× magnification, utilizing both polarized and non-polarized light. High-resolution dermoscopic images were captured with an iPhone 13 Pro Max camera attached to the device, and the dates and times of image capture were automatically recorded. All examinations were conducted under the supervision of consultants from the Dermoscopy Subspecialty Core Group of the Philippine Dermatological Society.

Dermoscopic assessment focused on several parameters adapted from the study by Al Refu [3], including altered pigmentation within lesions, edge definition (well- or ill-defined), the presence of scales within or around lesions, perifollicular pigmentation, perilesional hyperpigmentation, hair color changes within lesions, vascular morphology and arrangement including telangiectasia, and the identification of distinctive dermoscopic patterns. The findings using dermoscopy were interpreted with the help of all investigators. The terminology used in dermatoscopy followed the International Society of Dermoscopy's third consensus conference [7] for illustrating and summarizing the findings.

Other Diagnostic Procedures

Patients with scaly hypomelanotic lesions underwent a Potassium Hydroxide (KOH) examination to evaluate for fungal etiology. Skin scrapings were collected from the affected areas, mounted on microscope slides with 10% KOH, and examined by trained personnel at the institutional clinical laboratory. A diagnosis of pityriasis versicolor was confirmed upon identifying characteristic fungal elements showing the typical "spaghetti and meatballs" appearance.

Pityriasis alba was diagnosed clinically in patients presenting with hypopigmented macules and patches on the head or neck, negative KOH results, and a history of atopy. Indeterminate leprosy was suspected in patients with hypopigmented macules or patches accompanied by altered sensation. Sensory testing, including light touch, pinprick, and temperature assessment, was performed on both lesional and non-lesional skin to evaluate sensory impairment.

Skin punch biopsies were obtained for histopathological confirmation in suspected cases of vitiligo, idiopathic guttate hypomelanosis, nevus depigmentosus, and

leprosy, following standard aseptic protocols. In patients with biopsy-confirmed vitiligo, supplementary Melan-A staining was performed to assess melanocyte presence and distribution. Additionally, all lesions were examined under a Wood's lamp to assess pigmentary changes and aid in differential diagnosis.

Analysis

Descriptive statistics were used to summarize demographic and clinical data. Categorical variables were presented as frequencies and percentages, while continuous variables were expressed as means with standard deviations. All data were securely stored using the Kobo Toolbox programmed by the Department of Epidemiology and Biostatistics (DEBS), with access restricted to the primary investigators and statisticians. Results were analysed to describe dermoscopic features observed in common hypomelanotic conditions.

Results

Sociodemographic Profile of Patients

A total of 48 patients with hypomelanotic skin disease were recruited for this study. **Table 1** summarizes the sociodemographic characteristics of the patients. Of these, 26 (54.17%) were male and 22 (45.83%) were female. Most patients (56.25%) were aged 18–24 years, with a mean age of 28.31 ± 13.01 years. Regarding civil status, 25 (52.08%) were married, 16 (33.33%) were single, and 7 (14.58%) were widowed. In terms of socioeconomic status, 25 (52.08%) belonged to the middle-income group, followed by 16 (33.33%) in the low-income group. The most common sites of lesion predilection were the extremities (n=17, 35.4%), back (n=13, 27.1%), and chest (n=12, 25%), while a smaller proportion of patients (n=6, 12.5%) had lesions on the face. For skin type distribution, 23 (47.9%) were classified as Fitzpatrick skin type III, 21 (43.8%) as type IV, and 4 (8.3%) as type V.

Clinical and Diagnostic Characteristics of Hypopigmented Macular Disorders

Table 2 summarizes the clinical and diagnostic characteristics of patients with hypomelanotic macular diseases, including vitiligo (n=11), pityriasis alba (n=9), pityriasis versicolor (n=27), and nevus depigmentosus (n=1).

Table 1. Sociodemographic characteristics of patients (n=48).

Category	Frequency	%
Mean age ± SD	28.82 ± 13.01	
Range	18-65	
Age (years)		
18-24	27	56.25
25-34	7	14.58
35-44	7	14.58
45-54	4	8.33
55-65	3	6.25
Sex		
Male	26	54.17
Female	22	45.83
Civil Status		
Single	16	33.33
Married	25	52.08
Widowed	7	14.58
Socioeconomic status (₱)		
<21,000	16	33.33
21,000 - 76,000	25	52.08
> 76,000	7	14.58
Lesion site		
Extremities	17	35.40
Back	13	27.10
Chest	12	25.00
Face	6	12.50
Fitzpatrick skin type		
III	23	47.90
IV	21	43.80
V	4	8.30

Vitiligo

Patients diagnosed with vitiligo presented with solitary or multiple depigmented macules and patches, typically with well-defined borders.

Approximately 90.91% of these patients had lesions without scaling or pruritus. All vitiligo patients demonstrated negative findings on KOH skin scraping and exhibited sharply demarcated bright blue-white fluorescence under Wood's lamp examination.

Pityriasis alba

Patients with pityriasis alba presented with few to multiple macules and patches exhibiting hypopigmentation to mild erythema, most of which were characterized by ill-defined borders. Approximately 77.78% of patients had lesions without scaling, while 66.67% reported pruritus. All patients with pityriasis alba demonstrated negative KOH skin scraping findings, and Wood's lamp examination revealed no fluorescence in any case.

Pityriasis versicolor

Patients with pityriasis versicolor presented with hypopigmented macules and patches with ill-defined borders, predominantly affecting the face, neck, upper trunk, and extremities. Scaling was observed in 67.86% of patients. Approximately 60.71% of patients reported no pruritus, while 39.29% experienced pruritus. The majority of patients (89.29%) had positive KOH findings, demonstrating short, angular hyphae in clusters, producing the characteristic "spaghetti and meatball" appearance. Yellowish-green fluorescence was consistently observed on the lesions under Wood's lamp examination.

Nevus depigmentosus

The single patient diagnosed with nevus depigmentosus presented with a solitary hypopigmented macule with ill-defined borders. The lesion was non-scaly and without associated pruritus. KOH skin scraping was negative, and Wood's lamp examination showed faint accentuation of the lesion without fluorescence.

Dermoscopic Features of Hypopigmented Disease

Table 3 summarizes the dermoscopic features of hypopigmented diseases among the 48 patients. The patterns include altered pigmentation within lesions, edge definition (well- or ill-defined), presence of scales within or around lesions, perifollicular pigmentation, perilesional hyper-pigmentation, hair color changes within lesions, vascular morphology including telangiectasia, and distinctive dermoscopic patterns.

Vitiligo

Figure 1A to **Figure 1E** illustrates the clinical, dermoscopic, and histopathologic features of vitiligo in one of the patients. Most patients (81.82%) demonstrated perifollicular pigmentation. With regard to hyperpigmentation patterns, 54.55% showed no specific changes, while 36.36% exhibited lesional hyperpigmentation. In terms of hair color, 54.55% had normal hair, whereas 45.45% presented with white vellus hair. Morphologic vascular structures or telangiectasia were absent in 63.64% of cases. Distinctive dermoscopic patterns also varied: 40% of patients demonstrated diffuse depigmented white glow and trichrome patterns, while 30% showed a white pigment network.

Histopathologic examination was performed on all vitiligo patients. Findings consistently demonstrated a basket-woven stratum corneum, a marked reduction in melanocytes at the basement membrane zone, mild superficial perivascular lymphocytic infiltration, and the presence of pigment-laden macrophages **(Figure 1D)**. These findings were consistent with the diagnosis of vitiligo.

Table 2. Clinical and diagnostic characteristics of patients with hypomelanotic macular diseases.

Criteria	Vitiligo (n=11)	Pityriasis Alba (n=9)	Pityriasis Versicolor (n=27)	Nevus depigmentosus (n=1)
Altered pigmentation within the lesions				
Few depigmented macules and patches	2 (18.18%)	-	-	-
Multiple depigmented macules and patches	8 (72.73%)	-	-	-
Solitary depigmented macules and patches	1 (9.09%)	-	-	-
Hypopigmented macules and patches	-	6 (66.67%)	-	-
Hypopigmented to erythematous macules	-	1 (11.11%)	1 (3.70%)	-
Hypopigmented macules and globules	-	2 (22.22%)	26 (96.30%)	-
Multiple faint reticular hypopigmented network	-	-	-	1 (100%)
Edge definition or lesion borders				
Well-defined	11 (100%)	0 (0%)	2 (7.41%)	0 (0%)
Ill-defined	0 (0%)	9 (100%)	25 (92.59%)	1 (100%)
Scales				
Absent	10 (90.90%)	7 (77.80%)	9 (33.33%)	1 (100%)
Present	1 (9.10%)	2 (22.20%)	18 (66.67%)	0 (0%)
Nature of scales				
Few scales	11 (100%)	3 (33.33%)	19 (70.37%)	-
Multiple scales	-	1 (11.11%)	3 (11.11%)	-
Non-scaly	-	5 (55.56%)	5 (18.52%)	1 (100%)
Pruritus				
Absent	10 (90.90%)	3 (33.30%)	16 (59.26%)	1 (100%)
Present	1 (9.10%)	6 (66.70%)	11 (40.74%)	0 (0%)
KOH test				
Positive	0 (0%)	0 (0%)	24 (88.89%)	0 (0%)
Negative	11 (100%)	9 (100%)	3 (11.11%)	1 (100%)
Wood's lamp fluorescence				
Positive	11 (100%)	0 (0%)	27 (100%)	0 (0%)
Negative	0 (0%)	9 (100%)	0 (0%)	1 (100%)

The reduction or absence of melanocytes observed histologically corresponded with the dermoscopic appearance of a diffuse white glow over the affected lesions. This phenomenon is likely attributable to light-induced autofluorescence from dermal collagen due to melanocyte depletion, resulting in the observed bright white luminescence [4].

Pityriasis alba

A smaller proportion of patients presented with hypopigmented to erythematous macules (11.11%) and hypopigmented globules (22.22%). All patients exhibited ill-defined lesion borders, normal hair color, and absence of perifollicular pigmentation. Regarding lesion scaling, 55.56% had non-scaly lesions, 33.33% had few scales, and 11.11% had multiple scales. Hyperpigmentation changes were absent in the majority of cases (77.78%), while a small proportion (11.11%) demonstrated lesional or non-lesional hyperpigmentation. Analysis of distinctive dermoscopic patterns showed that 57.14% of patients exhibited no specific pattern, whereas 28.57% demonstrated a hypopigmented pigment network with globules. **Figure 2A** to **Figure 2B** illustrate the clinical and dermoscopic features of pityriasis alba in one patient.

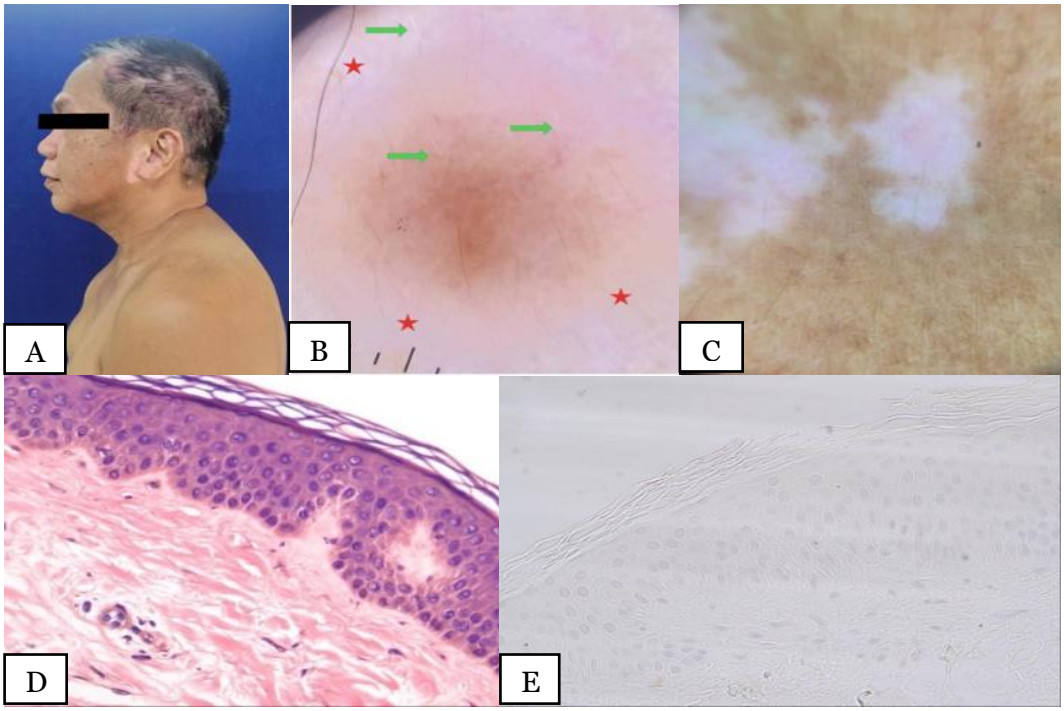

Figure 1. (A) A 54-year-old male with a 10-year history of multiple, well-defined hypopigmented patches on the face and extremities; **(B)** Dermoscopy using polarized light showing areas of diffuse white glow (red stars) and white villus hair (green arrow); **(C)** Dermoscopy using non-polarized light demonstrating a trichrome pattern with depigmented areas, lighter hypopigmented zones, and normal skin; **(D)** Histopathology showing a suspicious decrease in melanocytes at the basement membrane zone; **(E)** Positive Melan-A immunostaining confirming melanocyte presence.

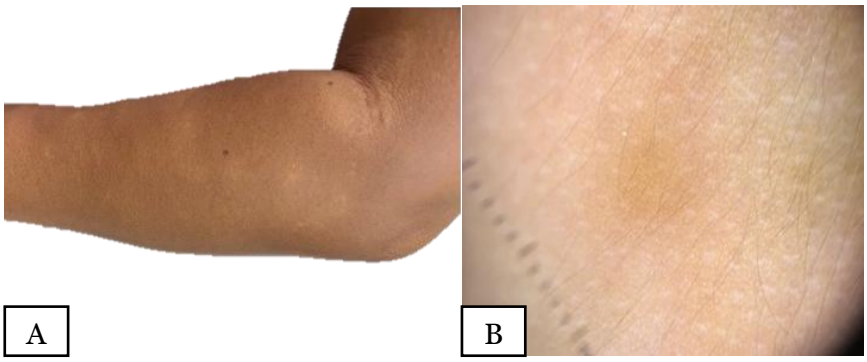

Figure 2. (A) A 20-year-old female patient with atopic dermatitis presenting with ill-defined hypopigmented patches on her upper extremities; **(B)** Dermoscopy using non-polarized light reveals areas of hypopigmentation with poorly defined margins, making it difficult to distinguish them from the surrounding skin.

Table 3. Dermoscopic features of hypomelanotic macular diseases.

Disease	Dermoscopic Features	Frequency (%)
Vitiligo	• Well-defined non-scaly depigmented borders with areas of diffuse white glow	4 (40.00%)
	• With perifollicular pigmentation	9 (81.82%)
	• Trichrome pattern	4 (40.00%)
	• Areas of white pigment network; white vellus hair	5 (45.45%)
Pityriasis versicolor	• Ill-defined hypopigmented areas with white dots and globules with fine scales	12 (43.45%)
	• Fine scales along skin creases	8 (30.45%)
	• Hypopigmented areas with white blotches and pigment network	7 (26.15%)
Pityriasis alba	• Poorly-demarcated, non-scaly, hypopigmented network and globules	4 (28.58%)
	• Erythematous changes	3 (33.33%)
Nevus depigmentosus	• Faint reticular hypopigmented network with serrated margin	1 (100.00%)

Pityriasis versicolor

The majority of patients (96.30%) presented with hypopigmented macules, patches, and globules, with ill-defined borders observed in 92.86% of cases. Lesions were distributed on the face, neck, upper trunk, and extremities in all patients. Most patients exhibited non-pruritic lesions and positive KOH skin scrapings. Regarding lesion scaling, 71.43% of patients had few scales, 17.86% had non-scaly lesions, and 10.71% had multiple scales. Perifollicular pigmentation was absent in 89.29% of cases. Similarly, 71.43% of patients showed no hyperpigmentation changes, and all patients (100%) had normal hair color. Additionally, 89.28% of patients exhibited no vascular or telangiectatic features.

Analysis of distinctive dermoscopic patterns revealed variable findings. 43.45% of patients showed hypopigmented areas with white dots and globules accompanied by fine scales, 30.45% displayed fine scales along skin creases, and 26.15% demonstrated hypopigmented areas with white blotches and pigment networks. **Figure 3A** to **Figure 3B** illustrate the clinical and dermoscopic features of pityriasis alba in one patient.

Nevus depigmentosus

The single patient diagnosed with nevus depigmentosus presented with multiple ill-defined, hypopigmented, non-scaly macules **(Figure 4A)**. There was no evidence of perifollicular pigmentation, hyperpigmentation, or vascular structures. The patient had normal hair, and dermoscopic examination revealed a faint reticular hypopigmented network with a serrated margin **(Figure 4B, 4C).**

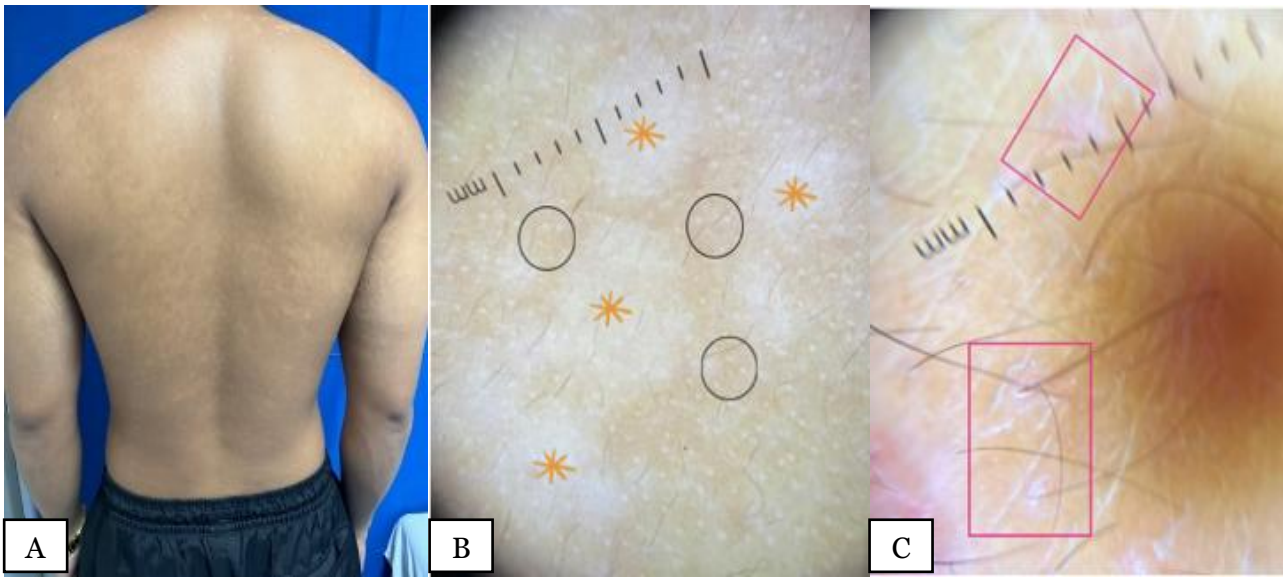

Figure 3. (A) A 20-year-old male presenting with a 3-month history of multiple, ill-defined, irregularly shaped hypopigmented macules and patches on the back; **(B)** Dermoscopy under non-polarized light reveals hypopigmented blotches and a pigment network (orange asterisk) with adjacent white dots (black circle); **(C)** Fine white scales along skin creases observed under polarized light.

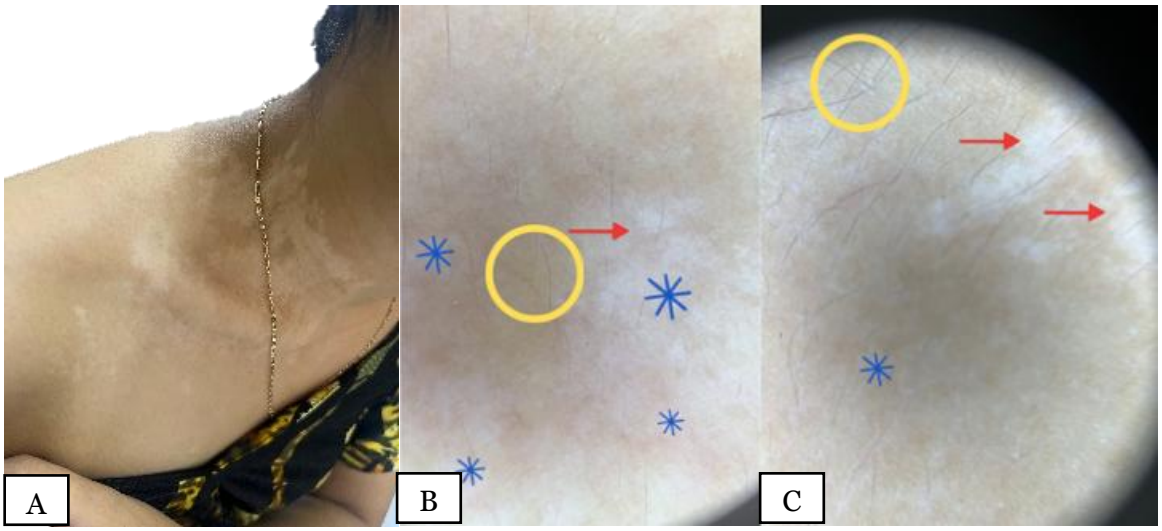

Figure 4. (A) A 20-year-old female with a 20-year history of hypopigmented, well-defined patches with irregular borders on the right neck; **(B) (C)** Dermoscopy (polarized light) showing hypopigmented patches with serrated borders (red arrow), loss of pigment networks (blue asterisk), and normal hair color (yellow circle).

Discussion

Hypomelanotic macular or patchy lesions are among the most common complaints in dermatology clinics. At the dermatology outpatient department of the Research Institute for Tropical Medicine, approximately 377 patients sought consultation for such lesions in 2023. These included 225 with pityriasis versicolor, 20 with pityriasis alba, 129 with vitiligo, and 3 with nevus depigmentosus. Several studies have documented the dermoscopic features of various hypomelanotic skin conditions, including idiopathic guttate hypomelanosis, pityriasis versicolor, vitiligo, nevus depigmentosus, pityriasis alba, and lichen sclerosus [3,5,8,9]. However, a more comprehensive synthesis of these findings is warranted, and standardized data reporting would be valuable for future reference. This study demonstrated that hypomelanotic macular diseases exhibit distinct dermoscopic patterns, enhancing diagnostic accuracy and facilitating differentiation between clinically similar conditions. While largely consistent with existing literature, these findings also provide additional insights relevant to local dermatologists.

The key dermoscopic features of vitiligo include a diffuse depigmented white glow, perifollicular pigmentary changes, perilesional hyperpigmentation, leukotrichia, and altered pigment networks [3]. Additionally, dermoscopic features provide valuable parameters for evaluating disease activity and can aid in distinguishing between stable and progressive forms of vitiligo. Among these, perifollicular depigmentation (PFD) is typically associated with stable disease, whereas perifollicular pigmentation (PFP) suggests active disease. Additional dermoscopic findings such as starburst patterns, comet-tail appearance, and the “tapioca sago” sign are indicators of progressive vitiligo [10]. Several studies have confirmed the diagnostic utility of dermoscopy in vitiligo, demonstrating consistent findings of PFD, trichrome patterns, and reverse pigmentary networks [10,11].

Our results align with previous reports, showing frequent PFD, diffuse depigmented white glow, and trichrome patterns, which are indicative of stable vitiligo. Some patients also exhibited PFP, increased perilesional pigmentation, and white pigment networks, which may suggest progressive disease. Additionally, all patients presented with lesions that had well-defined borders, which also indicate stable vitiligo consistent with established diagnostic criteria [11].

Pityriasis versicolor is a superficial mycosis caused by the lipophilic fungus Malassezia [11]. Clinically, it presents as hyperpigmented, hypopigmented, or erythematous round-to-oval macules and patches with fine scaling, most commonly affecting the upper chest, back, upper arms, neck, and face. The most frequently reported dermoscopic feature is an altered pigmentary network, followed by scaling. Mathur et al. similarly found non-uniform pigmentation to be the predominant dermoscopic finding [12]. Other notable dermoscopic features include folliculocentric patterns, contrast halo rings around altered pigmentation, and yeast invasion of hair follicles [3]. Anecdotal findings such as patchy scaling, inconspicuous ridges and furrows, and perilesional hyperpigmentation have also been described [12]. In another study, a disrupted or non-uniform pigment network, often folliculocentric, was reported in approximately 67% of pityriasis versicolor cases, while scaling was observed in 83% [13].

In this study, patients with pityriasis versicolor demonstrated similar findings. The most common dermoscopic features were ill-defined hypopigmented macules, patches, and globules with fine scales. Disrupted pigment networks, white dots, globules, and blotches, as well as fine scaling along skin creases, were also observed. According to Kaur et al., these hypopigmented networks seen on dermoscopy

result from the presence of Malassezia fungus in the skin, which produces aberrant melanosome granules that impair melanin transfer to keratinocytes. Furthermore, it has been proposed that Malassezia releases dicarboxylic acids, similar to azelaic acid, which inhibit tyrosinase activity and induce cytotoxic damage to melanocytes [13]. The altered pigmentary network observed in pityriasis versicolor is also likely attributable to a reduction in melanocyte quantity, as supported by histopathological findings [14].

Satellite lesions, characterized by adjacent white dots and globules near ill-defined hypopigmented blotches [3], were also observed in several patients. In one cross-sectional study, 85% of pityriasis versicolor cases exhibited satellite lesions, highlighting their usefulness as a distinguishing feature from other hypomelanotic disorders. Several patients in this study also demonstrated fine scaling, particularly along skin creases. Histopathologically, this scaling corresponds to hyperkeratosis of the stratum corneum [14]. Clinically, the fine scales may result from scratching, causing detached scales within skin creases to split into two layers, a phenomenon described as "double-edged" scaling [11].

Pityriasis alba is a benign skin condition that primarily affects preadolescent children and is strongly associated with atopy, reported in up to 85% of cases. It commonly affects the head and neck, presenting as hypopigmented macules or patches, typically diagnosed based on clinical findings. The most frequently reported dermoscopic feature is ill-defined hypopigmented macules with fine scales [3]. These findings are consistent with the present study, in which most patients exhibited ill-defined borders, hypopigmented macules and patches with fine scaling, and normal hair color without evidence of perifollicular pigmentation.

Because of the absence of a sharp margin separating hypopigmented lesions from the surrounding skin, some individuals may present with hypopigmented to erythematous macules, as well as hypopigmented macules and globules, as observed in this study. Histologically, acanthosis and reduced melanin within the epidermis contribute to the appearance of white structureless areas, while hyperkeratosis and parakeratosis account for the fine scaling commonly observed in these lesions [9].

Nevus depigmentosus is a skin disorder caused by defective transfer of melanosomes to keratinocytes [11]. On dermoscopy, it typically demonstrates a faint, uniform reticular pigment network with irregular, serrated borders and an absence of a diffuse white glow, features that distinguish it from vitiligo [3,15-17]. The sole patient diagnosed with nevus depigmentosus in this study exhibited similar findings, showing a faint reticular hypopigmented network with a serrated margin, suggesting residual melanin within melanocytes. This observation is consistent with Ankad and Shah, who reported that the presence of melanocytes reinforces the concept that melanin transfer to keratinocytes is defective in nevus depigmentosus [18]. Histopathologic findings indicate that melanocytes are preserved, but melanin content is reduced, as evidenced by normal to slightly decreased melanocyte counts on S-100 staining, decreased reactivity with the 3,4-dihydroxyphenylalanine reaction, and absence of melanin incontinence [19].

A key limitation of this study is the small sample size and the uneven distribution of cases across different types of hypomelanotic macular diseases, which may limit the generalizability of the findings. Future studies should include larger, more representative cohorts to better capture the spectrum of hypomelanotic diseases in the Philippines. Additionally, multicenter studies across diverse regions and populations would further strengthen the robustness and external validity of the results.

Conclusion

This study reinforces existing literature supporting the utility of dermoscopy as an adjunctive tool in the evaluation of hypomelanotic macular diseases. Dermoscopy improves diagnostic accuracy and may reduce the need for invasive procedures in selected cases; however, it cannot replace histopathological confirmation when a definitive diagnosis is required. Its role is particularly valuable in resource-limited settings, such as rural areas where access to biopsy facilities may be restricted.

The integration of basic dermoscopy training into routine clinical practice has the potential to significantly enhance the early and accurate diagnosis of hypomelanotic macular diseases. When combined with thorough history-taking and physical examination, dermoscopy increases clinical confidence, especially in cases with early, subtle, or atypical presentations. Moving forward, incorporating dermoscopy into dermatology training programs and encouraging its application at the primary care level may help reduce diagnostic delays and improve patient outcomes, particularly in underserved and resource-limited regions.

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Potential Conflict of Interest

The authors declare no potential conflicts of interest.

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ORIGINAL ARTICLE

The Impact of Social Media on Dermatology Practice in the Philippines: A Cross-Sectional Study

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Abstract: The rise of social media has significantly transformed how people communicate and share information, including within the medical field. In dermatology, practitioners increasingly use social media to engage with patients and disseminate medical knowledge. This study examined dermatologists' preferences and usage patterns of social media for professional purposes and assessed their perceptions of its advantages and disadvantages in practice in the Philippines. In this cross-sectional study, 279 dermatologists including residents, diplomates, and fellows completed an online questionnaire on their social media usage and perceptions, and the responses were statistically analysed using SPSS. Most respondents were board-certified dermatologists (diplomates and fellows), with 53.41% in solo practice and 41.22% in group practices. The majority were female (86.02%), with a median age of 35.5 years. Among the surveyed dermatologists, 58.84% used social media for online consultations, and 51.26% used it to share health information. Facebook was the most commonly used platform for both purposes. In clinical practice, the majority of respondents reported that 20–40% of their patients were referred through social media. Dermatologists strongly agreed that social media is a valuable tool for promoting collaboration among healthcare professionals, but they also expressed concerns about potential violations of patient confidentiality and privacy. Despite these risks, social media offers significant opportunities to provide reliable health information, enhance patient engagement, improve adherence to treatment plans, strengthen doctor-patient relationships, and foster professional networking. To maximize these benefits, dermatologists must safeguard patient privacy, ensure information accuracy and credibility, and adhere to ethical guidelines established by their professional societies and countries. Responsible and informed use of social media is essential to harness its potential for improving dermatology practice and patient care.

Keywords: Social media, Dermatologist, Digital healthcare, Facebook, Instagram, Teledermatology, Patient education, Online marketing

Introduction

Social media are interactive platforms that enable user-generated content, real-time communication, and collaboration across diverse audiences [1]. With over 4.62 billion users worldwide in 2022, including 73 million in the Philippines, social media continues to reshape various sectors, including healthcare [2]. A study by Griffis et al. [3] in the United States reported that 99% of hospitals had adopted at least one social media platform to interact with patients, underscoring its growing integration into healthcare delivery.

In dermatology, "internet dermatology" has rapidly emerged as a popular topic, with social media platforms [4] such as Instagram, Facebook, YouTube, and TikTok becoming widely used for dermatologic information and consultations. Given the highly visual nature of dermatology, it is likely that dermatologists utilize social media more frequently than specialists in other fields [5].

The COVID-19 pandemic further accelerated the adoption of digital healthcare solutions [6]. Lockdowns and social distancing measures prompted a significant shift toward telemedicine to ensure continued care while minimizing the risk of SARS-CoV-2 transmission. In 2020, the American Academy of Dermatology (AAD) Teledermatology Task Force reported that the use of teledermatology among its members surged from 14.1% to 96.9%, with most dermatologists expressing an intention to maintain teledermatology services post-pandemic [7].

In the Philippines, a similar trend was observed. A study by Angeles et al. highlighted a substantial impact of the pandemic on dermatology practice, including a more than 50% reduction in clinic hours, patient volume, and both aesthetic and non-aesthetic procedures. During this period, 15% of dermatologists managed patients exclusively via tele-dermatology, another 15% continued face-to-face consultations, and the majority (70%) adopted a hybrid approach. A six-fold increase in teledermatology utilization was noted, with Viber and Facebook Messenger being the most commonly used consultation platforms. Other tools included WhatsApp, Zoom, SeriousMD, Medifi, Skype, and Google Meet [8].

Beyond telemedicine, dermatologists increasingly leverage social media to build their personal brand and engage with patients [9]. A recent study by Alhayaza et al. in Saudi Arabia found that 82.8% of dermatologists believed social media had transformed their practice [10]. In this technology-driven era, keeping pace with digital advancements is essential for thriving in dermatology. While social media is widely used, there remains limited evidence on whether a dermatologist's online presence directly influences patient acquisition.

Given the Philippines' high social media penetration, this study aimed to examine how dermatologists in the Philippines use social media for both personal and professional purposes. It also evaluated their perceptions and attitudes toward social media use and assessed its influence on their clinical practice. To the best of our knowledge, there is a scarcity of publications exploring dermatologists' use of social media as a tool in dermatology practice, as well as their perceptions and attitudes toward it, in the Philippines. The researchers anticipate that the findings will help guide future strategies for social media engagement and telemedicine utilization among dermatologists in the Philippines and neighbouring Asian countries.

Methodology

Study Design

A cross-sectional study was conducted between April and October 2023 using a self-administered questionnaire distributed to dermatology residents and board-certified dermatologists in the Philippines to explore their social media usage and perceptions of its impact on their practice. Respondents included dermatologists

practicing in academic institutions, non-academic private clinics, and government-affiliated facilities, and were recruited through a non-probability snowball sampling method.

Study Procedures

The questionnaire was developed by the authors based on a review of relevant literature and findings from previous studies [10,11]. It was created using the Google Forms platform (Google Inc., Mountain View, CA) and included items on demographic data, social media usage for online consultations, health information dissemination, and perceptions of social media's impact on dermatology practice. Pilot testing of the online questionnaire was conducted among dermatology residents, diplomates, and fellows to assess its reliability, completion time, and clarity. Additionally, face validation was conducted to ensure that the questions adequately and accurately measured both positive and negative perceptions. Feedback on their survey experience was collected and incorporated into revisions of the questionnaire. The respondents for pilot testing were excluded from the final study sample.

The finalized questionnaire was disseminated online to eligible respondents via email and through the Philippine Dermatological Society (PDS) Viber group, which comprises approximately 1,000 active members. To increase the response rate, respondents were encouraged to invite other board-certified dermatologists who were willing to participate, regardless of their social media use. To ensure response validity, the Google Form was limited to one submission per email address. Email addresses were collected solely to provide respondents with a copy of their completed responses.

Sample Size

The sample size was calculated based on the assumption that 50% of dermatologists perceived social media as having a negative impact on their practice. With an α level of 0.05, a maximum tolerable error of 5%, and considering the estimated active members of the PDS (n=1,000), the required sample size was 278 respondents.

Study Variables

Sociodemographic characteristics

Respondents' sociodemographic profile, including age, gender, credentials, area of practice, and years of experience, was collected. In addition, respondents were categorized according to their professional status within the PDS:

- **Residents:** dermatologists-in-training currently enrolled in an accredited residency program in dermatology.
- **Diplomates** board-certified dermatologists who have passed the diplomate examination and have less than three years of independent dermatologic practice.
- **Fellows/Consultants:** dermatologists who have attained fellowship status with the PDS, typically signifying advanced training, extensive clinical experience, and/or contributions to the field through academic or leadership roles.

Social media use

Information on the preferred social media platforms for both personal and professional purposes, as well as the frequency and duration of use, was collected.

Perceptions

Respondents' perceptions regarding the benefits, applications, and risks of social media were assessed using both open-ended questions and Likert-scale items. Items were rated on a five-point scale, ranging from strongly agree (5) to

strongly disagree (1), and average scores for each category were then computed.

Ethical Consideration

This study was approved by the Research Institute for Tropical Medicine Institutional Review Board (RITM IRB Approval No. 2022-31). Ethical principles were strictly observed, ensuring voluntary participation, informed consent, and respondent anonymity. No compensation was provided for questionnaire completion. Consent was obtained at the beginning of the questionnaire, and approval of the electronic informed consent was mandatory for participation. If consent was not provided, the questionnaire was automatically terminated.

Statistical Analysis

Data were analysed using SPSS statistical software. Frequencies and percentages were reported for qualitative variables, while median scores and interquartile ranges were calculated for attitudes towards social media use. Respondents' attitudes were compared across age, sex, credentials, years of experience, and frequency of social media use. Depending on the applicability, the Mann–Whitney U test and Kruskal–Wallis test were used for group comparisons. Odds ratios were also calculated to compare qualitative variables between groups. A p-value of <0.05 was considered statistically significant.

Results

Sociodemographic Characteristics of Respondents

A total of 279 dermatologists participated in the study, resulting in a response rate of 28.5%. The majority were female (86.02%), with a median age of 35.50 years. Most respondents were board-certified dermatologists (diplomates, fellow, consultant), while the remainder were dermatology residents. Among respondents, 53.41% were engaged in independent practice, while 41.22% shared practiced in group settings **(Table 1)**.

Table 1. Sociodemographic criteria of respondents (n=279).

	Frequency	Percent
Median age (IQR)	35.5 (10)	
Range	18-80	
Age (years old)		
<31	34	12.19
31-40	163	58.42
41-50	40	14.34
>50	39	13.98
Missing data	3	1.08
Sex		
Female	240	86.02
Male	39	13.98
Professional Title		
Diplomate/Fellow/ Consultant	208	74.55
Resident and others*	70	25.09
Missing data	1	0.36
Practice Setting		
Independent practice	149	53.41
Shared practice, hospital or any health care institution	115	41.22
University or academic based practice	55	19.71
Others**	8	2.87
Missing data	1	0.36
Years in practice		
<5 years	106	37.99
5-14 years	97	34.77
15-24 years	44	15.77
25-35 years	20	7.17
>35 years	12	4.30

**Included physicians in pre-residency-a two-month preliminary training period in PDS-accredited institutions undertaken prior to entry into residency proper.*
***Includes mixed or combined practice types, such as independent and government practice, private and government practice, fellowship or resident practice, visiting consultants (non-plantilla), hospital-based practice, and those planning to practice in provincial areas.*

Social Media Usage of Respondents

Table 2 illustrates the characteristics of social media usage among respondents. A vast majority (99.28%) reported having their own social media accounts, with Facebook (97.47%) and Instagram (85.56%) being the most frequently used platforms. Other commonly used platforms included YouTube (33.57%), Twitter (19.49%), and TikTok (12.27%). The purposes for which respondents engaged with social media were also explored. Most respondents (93.50%) reported using social media for personal reasons unrelated to clinical practice, while a substantial proportion used it for professional purposes, including online consultations (58.84%) and dissemination of health-related information (51.26%). Furthermore, 31.79% of dermatologists reported that 20–40% of their patients were referred via social media.

Table 3 shows respondents' social media usage for online consultations and health information, along with their user experience ratings. Among those using social media for online consultations, Facebook was the most frequently chosen platform (67.48%), followed by consultation applications such as SeriousMD, NowServing, Medifi, Doxy.me, and PPD (13.50%). More than a third of respondents (36.20%) used social media 2–4 times per week, while 20.86% used it monthly. Experience rating refers to a self-assessed measure where respondents evaluated the quality of their experience on a scale from 1 (very bad) to 10 (very good). Those using social media for online consultations reported a median score of 7.

For sharing health information, Facebook remained the preferred platform (73.24%), followed by Instagram (42.96%), with other platforms including Viber, YouTube, Twitter, TikTok, and Snapchat. Usage frequency varied, with the majority (50.70%) contributing information monthly. Median experience ratings for sharing health information were 8, reflecting overall satisfaction.

Table 2. Respondents' social media usage (n=279).

	Frequency	Percent
Having social media account?		
Yes	277	99.28
No	2	0.72
Social Media Platforms used		
Facebook	270	97.47
Instagram	237	85.56
YouTube	93	33.57
Twitter	54	19.49
TikTok	34	12.27
LinkedIn	32	11.55
Viber Messenger	7	2.53
Others*	15	5.42
Purpose of Using Social Media		
Personal	259	93.50
Online consultation	163	58.84
Contributing health information	142	51.26
Others**	13	4.69
Practice Attributable to Social Media Referrals		
<20%	73	26.07
20-40%	89	31.79
>40%	28	10.00
Do not use social media in practice	83	29.64
Missing data	7	2.50

**Snapchat, SeriousMD, Google Meet, Reddit, NowServing, Zoom*

***building professional networks, promoting services, updating clinic schedules, posting announcements, and sharing clinic information.*

Table 3. Respondents' social media usage for online consultation and health information.

	Online Consultation		Contributing Health Information	
	(n = 163)		(n = 142)	
	Frequency	Percent	Frequency	Percent
Social Media Platforms Used				
Facebook	110	67.48	104	73.24
Instagram	5	3.07	61	42.96
Viber Messenger	16	9.82	46	32.39
Google Meet	12	7.36	–	–
Zoom	9	5.52	–	–
YouTube	2	1.23	8	5.63
Consultation apps*	22	13.50	–	–
Others	5**	4.29	11***	7.75
Not specified	4	2.45	–	–
Frequency of Social Media Use				
Daily	24	14.72	3	2.11
2–4 times per week	59	36.20	15	10.56
Once a week	30	18.40	41	28.87
Monthly	34	20.86	72	50.70
Missing data	16	9.82	11	7.75
User Experience Rating	**(n=158)**		**(n=140)**	
Median (IQR), Range	7 (2) 1–10		8 (2) 1–10	

**SeriousMD, Doxy.me, NowServing, Medifi, PPD; ** WhatsApp, Telegram, Institution, WeChat; ***Twitter, TikTok, Snapchat;*

Perceptions of Social Media Use Among Respondents

This study explored the perceived benefits and drawbacks of using social media for dermatology consultations and the dissemination of health information, based on responses to open-ended survey questions. The qualitative data were analysed to identify recurring themes, which are summarized in **Table 4** and **Table 5.**

In the context of dermatology consultations via social media, the most frequently cited benefit was convenience and accessibility, as it enables remote consultations and broader patient outreach. Other reported advantages included low or no cost, enhanced visibility and marketing, and a reduced risk of infection due to the absence of face-to-face contact. However, several concerns emerged. Respondents highlighted issues related to patient data privacy and confidentiality, as well as the inherent limitations of online consultations, such as the inability to perform physical examinations, the risk of misdiagnosis due to poor image quality, and reduced opportunities to establish personal rapport. Other concerns included potential miscommunication, patients' expectations of free services, difficulties with medication dispensing, scheduling conflicts, and challenges in verifying patients' conditions.

For disseminating health information, social media use was generally perceived positively for several reasons. Among the reported benefits, the most frequently cited was its extensive reach, enabling dermatologists to engage with a broader and more diverse patient population. Respondents also emphasized the convenience and efficiency of using these plat-

Table 4. Respondents' perception of social media for online consultation.

	Frequency	Percent
Perceived advantages		
Convenience	73	44.79
Accessibility	68	41.72
Low cost/Practical/Free	12	7.36
Easy to communicate/ Visibility/Marketing	8	4.91
Can send photos/videos	6	3.68
No face-to-face contact/Safe	6	3.68
Continuity of care	6	3.68
Others*	2	1.23
Perceived disadvantages		
Inability to perform physical examination	35	21.47
Privacy and confidentiality concern	29	17.79
Patients reaching out beyond professional hours	28	17.18
Blurry photos or videos	28	17.18
Lack of interaction or rapport	20	12.27
Internet issues (low connectivity/no access)	20	12.27
Miscommunication issues	9	5.52
Time consuming	5	3.07
Others**	8	4.91

**helps patients, less expenses*
***patients expect it to be free, inability to dispense medicine, scheduling issues, difficult to verify patients' issues.*

forms, which enhances the accessibility of reliable health-related content. Additionally, social media was regarded as a valuable tool for patient education, raising awareness, and promoting dermatology practices.

However, several concerns were identified. A key issue was the spread of misinformation, as dermatologists noted that content shared on social media could be misinterpreted, taken out of context, or altered by non-experts. On open platforms, posts may be reposted without attribution, edited with misleading headlines, or combined with unverified advice from influencers or commercial entities. Challenges were also reported in content creation, which some respondents described as both difficult and time-consuming. Additional concerns included negative audience feedback, the absence of standardized processes to verify information accuracy, ethical dilemmas related to marketing and promotion, and instances of unauthorized content use. Once health information is disseminated on social media, there is no mechanism to ensure its accuracy when it is reposted, summarized, or reinterpreted by others. More broadly, this highlights a fundamental limitation of social media, where medical information can be freely distributed without undergoing peer review.

Some respondents also expressed worry that patients might overly rely on online advice, potentially replacing traditional consultations.

Table 5. Respondents' perception of social media for contributing health information

	Frequency	Percent
Perceived advantages		
Accessibility/greater reach	56	39.44
Ease of sharing information/convenience	40	28.17
Health education/awareness	29	20.42
Marketing	19	13.38
Engagement with audience/patients	8	5.63
Low cost platform	5	3.52
Perceived disadvantages		
Fake news/misinformation	33	23.24
Time consuming/difficulty in creating posts	14	9.86
Negative feedback or comments	13	9.15
No way to evaluate validity of information	13	9.15
Can be misinterpreted	11	7.75
Security/privacy risks	8	5.63
People rely on online advice	6	4.23
Become consultations	4	2.82
Not all have social media	4	2.82
Others*	3	2.11

**Content used without consent from the doctor, posts can be easily ignored, may be perceived as self-promotion, technical issues (internet).*

Additional challenges reported included limited inclusivity due to unequal access to social media, the possibility of posts being overlooked, perceptions of self-promotion, and technical limitations such as unstable internet connectivity and restrictions on content formats.

Attitudes Toward Social Media Use Among Respondents

As shown in **Table 6**, respondents generally expressed positive viewpoints regarding the role of social media in dermatology practice (overall median = 3.71, IQR = 0.78). The strongest agreement was with the statement that social media enhances collaboration among physicians (Median = 5.0, IQR = 1.0). Respondents also agreed that social media improves healthcare delivery, facilitates patient education, and increases professional visibility. However, they disagreed with the statement that social media cannot breach patient privacy and confidentiality (Median = 2.0, IQR = 2.0), indicating ongoing concerns about data security.

Table 6. Respondents' attitudes toward social media use.

	Median	IQR	Interpretation
The use of social media in dermatology is overall positive for the field.	4	2	Agree
The use of social media in dermatology does not worsen the image of the field.	4	1	Agree
Patients respond positively to social media use by dermatology practices.	4	2	Agree
Use of social media helps in recruiting new patients.	4	1	Agree
Patients are more likely to prefer a dermatologist with a social media presence over one without.	3	1	Neutral
Social media strengthen physician-patient relationship.	4	1	Agree
Social media can help in the delivery of healthcare.	4	1	Agree
Social media can help improve professional knowledge.	4	1	Agree
Social media can increase collaboration among physicians.	5	1	Strongly Agree
Social media cannot damage one's professional image.	3	2	Neutral
Social media is a good tool for public health awareness.	4	1	Agree
Social media is a good tool for increasing patient management compliance.	4	1	Agree
Social media could not breach patient privacy and confidentiality.	2	2	Disagree
Social media does not have poor quality of information.	3	0	Neutral
Overall Median	**3.71**	**0.78**	**Agree**

1.00–1.80 = Strongly Disagree; 1.81–2.60 = Disagree; 2.61–3.40 = Neutral; 3.41–4.20 = Agree; 4.21–5.00 = Strongly Agree.
Source: Sözen, et al. [12]

Association Between Demographic Factors and Frequency of Social Media Use

Table 7 (Supplementary) summarizes the relationship between respondents' demographic profiles and the frequency of social media use for online consultations. Overall, professional title and years in practice demonstrated statistically significant associations with the frequency of social media use ($p<0.05$). Specifically, residents and other junior practitioners reported a higher likelihood of using social media at least 2–4 times per week compared to diplomates and fellows (OR = 2.20, 95% CI: 1.05–4.62). Similarly, dermatologists with fewer than five years of practice were more likely to engage in frequent online consultations (71.01%) than those with longer practice durations. Meanwhile, respondents with 15–24 years (OR = 0.18, 95% CI: 0.06–0.54) and 25–35 years (OR = 0.07, 95%

CI: 0.01–0.40) of experience showed a markedly lower likelihood of frequent social media use.

Regarding age, younger dermatologists aged 31–40 years tended to use social media more frequently (OR = 2.90, 95% CI: 0.99–8.52), although this result did not reach statistical significance. Similarly, no significant associations were observed for sex (OR = 1.48, 95% CI: 0.51–4.26).

Table 8 (Supplementary) summarizes the association between respondents' demographic characteristics and the frequency of social media use for sharing health information. The results show no statistically significant relationships across variables such as sex, age, professional title, and years in practice. These findings suggest that demographic factors did not substantially influence how frequently dermatologists used social media to share health-related content.

Association of Demographics and Social Media Use Frequency with Attitudes Toward Social Media

Table 9 (Supplementary) summarizes the association between respondents' demographic characteristics and their attitudes toward social media use. Significant differences were observed across age groups, professional titles, and years in practice ($p < 0.05$). Younger dermatologists (<31 years) reported more favourable attitudes toward social media (Median = 3.86, IQR = 0.50) compared to older groups, particularly those aged 41 and above. Similarly, residents and other junior practitioners demonstrated more positive perceptions (Median = 3.86, IQR = 0.50) than diplomates, fellows, and consultants (Median = 3.64, IQR = 0.79). Dermatologists with less than five years of practice also expressed stronger support for social media use (Median = 3.86, IQR = 0.43), whereas those with over 15 years of experience generally reported less favorable views. In contrast, sex was not significantly associated with attitudes toward social media ($p = 0.468$). These findings show that respondents' attitudes toward social media may be influenced by their professional title, age, and years of experience.

Table 10 (Supplementary) illustrates the relationship between the frequency of social media use for online consultations and health information dissemination and respondents' attitudes toward these platforms. Significant associations were observed for both purposes ($p < 0.05$). Dermatologists who used social media more frequently for online consultations (2–4 times per week) exhibited more positive attitudes (Median = 3.93, IQR = 0.43) compared to those using it once a week or less (Median = 3.64, IQR = 0.78). Similarly, dermatologists who shared health information more often (2–4 times weekly) reported the highest positive attitudes (Median = 4.14, IQR = 0.29), whereas less frequent users showed comparatively lower attitudes (Median = 3.86, IQR = 0.57). Hence, greater engagement with social media is associated with more favourable attitudes toward its use in dermatology practice.

Discussion

Over the last decade, social media use has expanded rapidly worldwide, and healthcare professionals, including dermatologists, have increasingly integrated these platforms into their practice. During the COVID-19 pandemic, teledermatology became an essential tool for maintaining continuity of care. Social media platforms complemented teledermatology by enabling dermatologists to engage with patients, disseminate health information, and provide virtual consultations, effectively bridging the gap between traditional practice and digital healthcare delivery. This study explored the patterns of social media use among dermatologists in the Philippines and examined their perceptions and attitudes toward these platforms.

Our findings revealed that most respondents owned social media accounts, which they used for online consultations, sharing

health-related information, and personal purposes. Among the platforms, Facebook emerged as the most frequently used for consultations, followed by consultation-specific applications such as SeriousMD and NowServing, while Instagram was used less often. These findings align with the study by Naik [13], which also reported Facebook as a primary channel for dermatologic consultations. Facebook was similarly identified as the preferred platform for disseminating health information, followed by Instagram. Interestingly, a study by Quijote et al. [14] highlighted that most healthcare content creators on social media were board-certified dermatologists, particularly active on Instagram and TikTok, underscoring their strong online presence.

In this study, a notable portion of respondents reported that approximately 20–40% of their patient referrals were attributed to social media, consistent with previous research indicating that social media plays only a minor or no role in patients' selection of a dermatologist [5]. Although the proportion of referrals is not high, this finding underscores the growing influence of digital platforms in dermatology practice. Other studies have also shown that some patients actively seek practitioners with a strong social media presence [15]. To maximize patient engagement, dermatologists are encouraged to highlight patient reviews, professional expertise, and original medical content on these platforms [5]. Given the inherently visual nature of dermatology, the specialty is particularly well-suited to leveraging social media for enhancing practice visibility and patient interaction.

Social media was also perceived to offer several advantages for online consultations, particularly in terms of accessibility, remote care, and continuity of consultations during the COVID-19 pandemic. However, several limitations were noted. These included the inability to perform physical examinations, especially for conditions requiring palpation or assessment of high-risk lesions and hair-bearing areas [16,17]. Other challenges reported included poor image quality, unstable internet connectivity, and difficulties in establishing strong doctor–patient rapport in virtual settings. In addition, concerns were raised regarding data privacy and confidentiality. For example, despite Facebook's strict privacy policies, apprehensions remain about potential third-party access to sensitive user data, including health records [18]. Therefore, despite the advantages of using social media in their practice, dermatologists should adopt secure practices, comply with data protection regulations, and ensure the ethical and responsible use of social media in clinical settings.

Many respondents supported the use of social media for health education, citing its wide reach and capacity to raise public awareness as key benefits. Pizzuti et al. [19] similarly reported that nearly 85% of physicians viewed social media as an effective educational tool, using it to share knowledge, participate in discussions, follow conference updates, and receive information from health authorities. Beyond patient engagement, these platforms facilitate professional networking by connecting dermatologists with colleagues, researchers, marketing professionals, conference organizers, and other industry stakeholders. Such networks not only enhance professional visibility but also foster opportunities for meaningful collaborations within the dermatology community [20].

Despite its benefits, significant challenges persist, particularly regarding misinformation, non-medical influencers, and ethical concerns. Quijote et al. [14] found that while Instagram hosts more physician-led content, platforms such as YouTube and TikTok are dominated by non-expert influencers. Inaccurate medical information disseminated by unqualified individuals can mislead patients and compromise public trust [21]. These findings emphasize the importance of maintaining a strong dermatologist-led presence online to

ensure that evidence-based information remains accessible to the public.

Additional ethical challenges involve the unauthorized use of physicians' content by companies for advertising purposes, often without consent. Similarly, dermatologists expressed concern about unethical product endorsements, which may compromise the credibility of health information. To address these issues, transparency is essential when promoting products or services online, especially when potential financial conflicts of interest exist. Given the ease of including product names and links in social media posts [22], clear disclosure practices are critical to preserving trust and professional integrity.

Lastly, generational differences in social media use were observed. Younger practitioners—particularly residents and early-career dermatologists—reported higher levels of engagement with digital platforms compared to their senior colleagues. This finding aligns with previous studies showing that younger physicians are generally more comfortable and proficient with digital tools [23,24]. In contrast, older dermatologists were less inclined to adopt these platforms, highlighting a potential digital gap. Targeted support and training for senior practitioners may help bridge this divide. Given the increasing integration of digital tools in patient education, professional networking, and practice promotion, providing structured guidance and education could further enhance digital engagement while mitigating potential ethical concerns.

Conclusion

This study provides an overview of dermatologists' perceptions and attitudes toward social media use in dermatological practice in the Philippines. It highlights the diverse ways these platforms are utilized, from online consultations to the dissemination of health information. Social media offers substantial potential for professional growth, patient education, and improved accessibility, yet challenges remain regarding privacy, misinformation, and ethical considerations. Dermatologists are encouraged to use these platforms responsibly by protecting patient data, maintaining professional boundaries, and sharing evidence-based information.

Given the growing role of social media in dermatology, professional bodies including dermatology societies, medical regulatory boards, and healthcare institutions should consider establishing clear guidelines for its ethical and responsible use. Furthermore, these organizations should provide support and resources to assist dermatologists in navigating the evolving digital landscape of healthcare communication.

Limitations of the Study

Selection bias may be a factor in our results, as those dermatologists with strong opinions on this topic may have been more inclined to respond than others. Moreover, the study may include potential response bias and underrepresentation of older dermatologists due to the online nature of the survey.

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Potential Conflict of Interest

The authors declare no potential conflicts of interest.

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Supplementary Table

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CASE REPORT

Confluent and Reticulated Papillomatosis: Two Cases in Females of Skin of Color

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Abstract: Confluent and reticulated papillomatosis (CARP) is an acquired ichthyosiform disorder characterized by hyperpigmented papules that coalesce into plaques, often displaying reticulated patterns along the periphery. It typically affects the upper trunk and neck, particularly in adolescents and young adults. Due to its close clinical resemblance, CARP is frequently misdiagnosed as acanthosis nigricans or pityriasis versicolor. Although oral minocycline remains the mainstay of treatment, oral isotretinoin has also shown effectiveness, as evidenced by reductions in scaling and pigmentation of lesions. This case series describes two female Filipino patients with CARP who were successfully treated with low-dose isotretinoin.

Keywords: Confluent and reticulated papillomatosis, Isotretinoin, Acanthosis nigricans

Introduction

Confluent and reticulated papillomatosis (CARP), first described by Gougerot and Carteaud, is characterized by hyperpigmented macules and papules that merge into plaques with a distinctive reticulated pattern at the periphery [1]. Although its exact pathophysiology remains unclear, several hypotheses have been proposed, including keratinization disorders, reactions to *Pityrosporum* species, endocrinopathy-related eruptions, bacterial or ultraviolet-induced responses, variations of amyloidosis, and potential genetic predispositions [2]. Diagnosis is primarily clinical, but a skin biopsy may be performed to exclude other dermatoses.

The strongest evidence supporting the theory that CARP is a keratinization disorder lies in its histopathological findings, which include an increased transitional cell layer, elevated lamellar granules within the stratum granulosum, and heightened involucrin expression [1]. While most cases are asymptomatic, treatment is often pursued for cosmetic reasons and to address the emotional distress associated with this pigmentary disorder [3].

In the Philippines, only 59 cases were reported between 2012 and 2023 [4]. Case reports on CARP involving Asian skin remain limited. Although oral minocycline is the

preferred first-line treatment [1], it is not readily available locally. Consequently, the authors opted to use low-dose isotretinoin, guided by its therapeutic relevance in keratinization disorders [5,6]. Through this case series, the authors aim to raise clinical awareness, present local clinical findings, and highlight potential therapeutic options for CARP.

Case Presentation

Case 1. A 22-year-old Filipino female with Fitzpatrick skin phototype IV and overweight presented with a six-month history of asymptomatic, multiple tan-to-brown reticulated macules coalescing into patches and plaques with fine, adherent scales forming a net-like pattern over the nape **(Figure 1A)**. No lesions were observed on the axillae or groin. An alcohol swab test and skin scraping with 10% potassium hydroxide were negative, ruling out terra firma-forme dermatosis and pityriasis versicolor, respectively. Dermoscopy revealed hyperpigmented dots, ridges, and a pinkish hue **(Figure 1B)**.

The patient had previously self-treated with over-the-counter papaya soap and vitamin C serum, but these were ineffective. Acanthosis nigricans (AN) was initially considered due to the lesion location and hyperpigmentation. However, diabetes mellitus screening, lipid profile, and liver enzyme levels were all within normal limits. A skin punch biopsy of the net-like lesions showed orthokeratosis, papillomatosis, and acanthosis **(Figure 1C)**. The absence of basal layer hyperpigmentation and melanocyte proliferation ruled out AN. As the histopathology findings were nonspecific, the final diagnosis of CARP was made based on the correlation of clinical, histopathologic, and laboratory findings.

The patient was started on oral isotretinoin at 0.1 mg/kg/day for a total treatment duration of 24 weeks. Prior to initiating therapy, she received counseling on the potential teratogenicity of isotretinoin and was advised to use both physical and oral contraceptives. Follow-up visits were scheduled every four weeks, with significant clinical improvement noted at the completion of treatment **(Figure 1D)**. Liver enzyme levels and lipid profiles, repeated at weeks 4 and 8, remained within normal ranges. At a 12-month post-treatment follow-up, there was no evidence of recurrence.

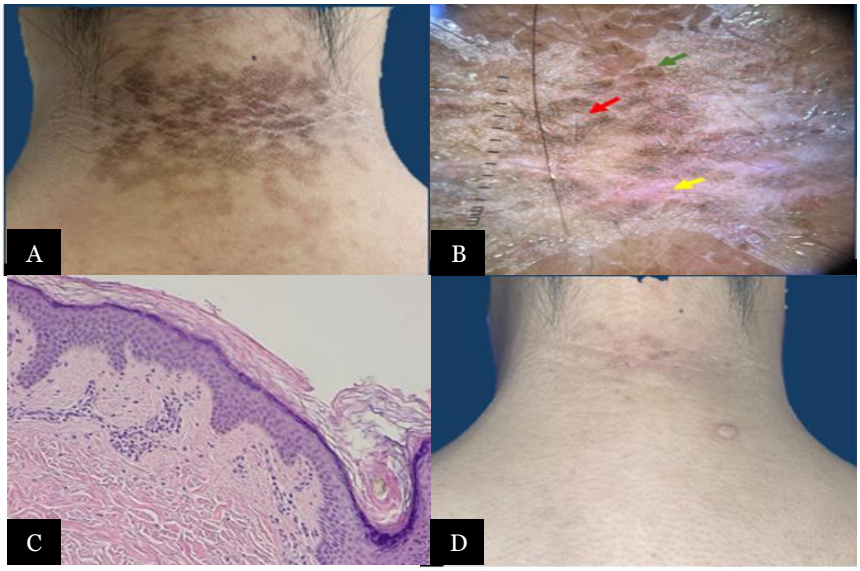

Figure 1. (A) The patient presented with tan-to-brown reticulated, net-like patches and plaques on the nape; **(B)** Dermoscopic examination revealed hyperpigmented dots (green arrow), ridges (red arrow), and a pinkish hue (yellow arrow); **(C)** Histopathology demonstrated orthokeratosis, papillomatosis, and acanthosis (hematoxylin and eosin [H&E], ×10); **(D)** Marked clinical improvement was observed 12 months after completion of low-dose isotretinoin therapy.

Case 2. A 15-year-old Filipino female with Fitzpatrick skin phototype IV and a normal BMI presented with a one-year history of multiple tan-to-brown reticulated macules coalescing into patches and plaques, accompanied by thin, fine scales over the chest, nape, and neck **(Figure 2A to 2C)**. To exclude terra firma-forme dermatosis, an alcohol swab test was performed, which yielded negative results. The grattage maneuver and 10% potassium hydroxide skin scraping were also negative, effectively ruling out pityriasis versicolor.

The patient had attempted self-medication using whitening agents, but these were ineffective. Dermoscopy revealed hyperpigmented dots and ridges **(Figure 3A)**. Histopathological examination demonstrated orthokeratosis, hypergranulosis, papillomatosis, and acanthosis, along with mild superficial perivascular lymphocytic infiltrates **(Figure 3B)**. Screening for diabetes mellitus, liver enzyme levels, and lipid profiles yielded normal findings. Based on the clinical, histopathological, and laboratory results, a diagnosis of CARP was made.

As the patient was a minor, therapeutic options and potential adverse effects were thoroughly discussed with her guardian. She was started on oral isotretinoin at 0.1 mg/kg/day for 24 weeks. Follow-up visits were conducted every four weeks, with progressive improvement noted, including a marked reduction in hyperpigmented lesions on the affected areas **(Figure 4A, 4B)**. Liver enzymes and lipid profiles were reassessed at the 4th and 8th weeks of treatment, showing no abnormalities. At the 12-month post-treatment follow-up, no recurrence of lesions was observed.

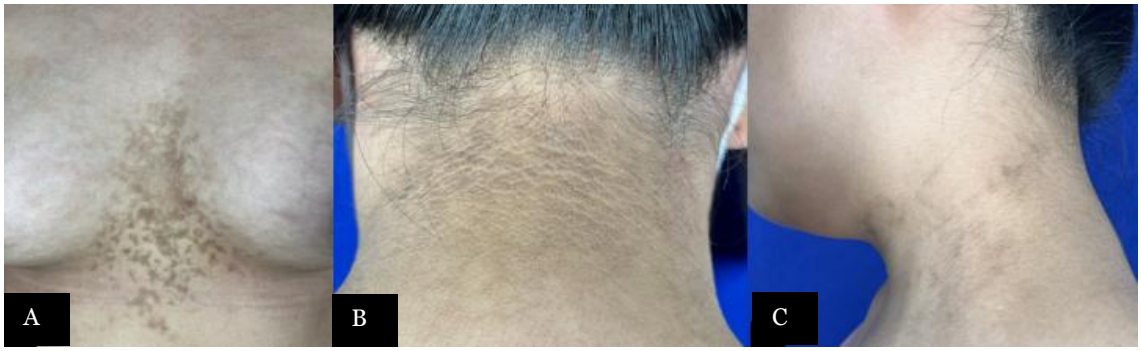

Figure 2. Patient presenting with coalescing tan-to-brown, reticulated patches and plaques on the chest **(A)**, nape **(B)**, and sides of the neck **(C)**.

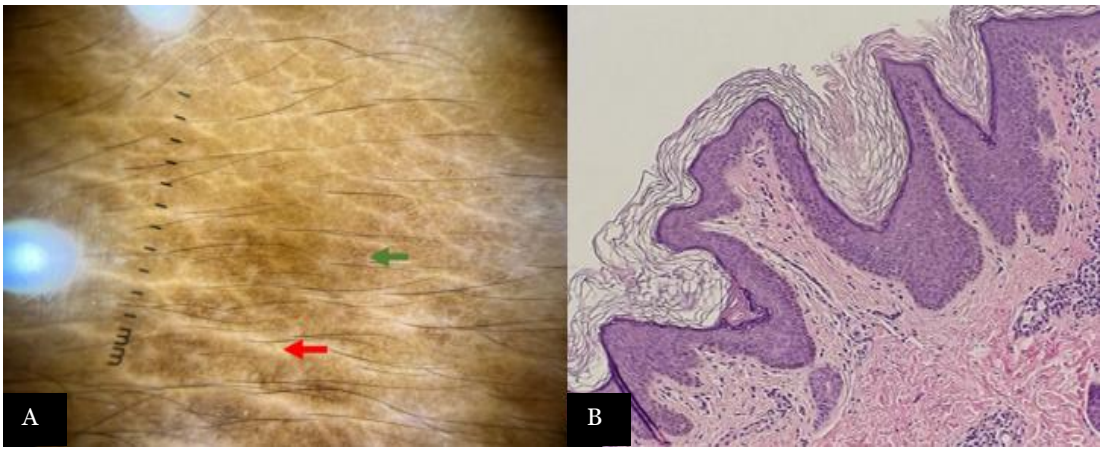

Figure 3. (A) Hyperpigmented dots (green arrow) and ridges (red arrow) were seen on dermoscopy; **(B)** Histopathology showing orthokeratosis, hypergranulosis, papillomatosis, and acanthosis (hematoxylin and eosin [H&E], 10x).

Figure 4. Patient showing decreased hyperpigmented lesions after treatment with low-dose isotretinoin (after 12 months post-treatment) on the chest **(A)**, nape **(B)**, and sides of the neck **(C)**.

Discussion

CARP is an uncommon dermatological condition that occurs more frequently in young Caucasian males [7]. In Southeast Asia, it shows a male-to-female ratio of 2.6:1 with a mean age of 29.1 years [8]. Similarly, in the Philippines, there is a reported male predominance of 1.5:1 [4]. According to the study by Huang et al. [8], CARP typically presents as confluent brown papules or plaques, most commonly affecting the upper trunk. The exact pathophysiology of CARP remains unclear, although one proposed hypothesis suggests a keratinization disorder [1]. Since CARP can be misdiagnosed as a fungal infection or pigmentary disorder, Jo et al. proposed a modified diagnostic criterion [3]:

a. Clinical presentation of scaly brown macules and patches, some reticulated and papillomatous.
b. Involvement of the upper trunk, neck, or flexural areas.
c. Negative fungal staining of scales or lack of response to antifungal treatment.
d. An excellent response to antibiotic therapy.

In our cases, the first three criteria were all fulfilled.

AN is one of the primary differential diagnoses for CARP. In a study by Park et al. (2015), obesity was found to be the only clinical feature significantly more common in the AN group than in the CARP group [9]. Although minor histopathological differences between CARP and AN have been observed, these differences are insufficient for definitive differentiation; therefore, clinicopathologic correlation remains essential [9]. Several studies also suggest that CARP and AN can co-exist, with some patients showing insulin resistance and obesity; however, this association has not been clearly established [10,11]. In our first case, although the patient's clinical presentation resembled AN, the net-like reticulated pattern, absence of obesity or endocrine disorders, and consistent clinical-histopathological findings, along with the diagnostic criteria by Jo et al. [3], supported a diagnosis of CARP.

The second case clinically resembled pityriasis versicolor, a superficial yeast infection caused by Malassezia, which commonly presents as hyperpigmented patches and plaques on the chest. Typically, a positive evoked scale sign, positive potassium hydroxide test, and the presence of hyphal elements would favor pityriasis versicolor [12]. However, as all these findings were negative in our patient, the condition was ultimately ruled out. In a case report by Ankad et al. [13], dermoscopic findings showed ridges corresponding to the confluent and reticulated nature of the papules and plaques, which was consistent with our observations.

Histopathology also contributes significantly to the diagnosis of CARP. A study by Tamraz et al. [14] in Lebanon reported epidermal changes such as hyperkeratosis, papillomatosis, and acanthosis in patients with CARP, findings that were also seen in our patient. Interestingly, the study further noted follicular plugging and anastomosis of the rete ridges in some patients, which may serve as useful distinguishing features from AN [14]. Correlating these histopathological findings with clinical and dermoscopic evidence is essential for establishing an accurate diagnosis. Dermatologists, with their expertise in combining clinical, dermoscopic, and histopathologic evaluations, play a pivotal role in both diagnosing and managing CARP.

Minocycline remains the first-line treatment for CARP [1]. However, due to the rising prevalence of antibiotic resistance in the Philippines, the authors aimed to practice antimicrobial stewardship [15]. Furthermore, considering the difficulty in obtaining the drug of choice, oral isotretinoin was selected as an alternative therapy. Several published studies have reported successful outcomes with isotretinoin in CARP patients, supporting its efficacy **(Table 1)**.

Table 1. Summary of reported cases of confluent and reticulated papillomatosis treated with oral isotretinoin.

Author(s) (Year)	Age/Sex	Ethnicity	Location	Treatment Regimen	Response	Comments
Hodge et al. [16]	20 / M	Black	Face, chest, back	Isotretinoin 40 mg/day for 2 months	Complete clearance at 2 months; slight recurrence at 4 months	Biopsy specimen from chest resembled AN, but overall findings consistent with CARP
Lee et al. [17]	18 / M	Black	Neck, back, chest	Isotretinoin 2 mg/kg/day for 3 months, then tapered to 1.14 mg/kg/day	No recurrence	No histopathologic distinction noted between AN and CARP
Solomon et al. [18]	14 / F	Black	Chest, back	Isotretinoin 1 mg/kg/day for 14 weeks + 10% lactic acid lotion thereafter	Lesions remained clear even at 18 months	No response to prior Minocycline treatment
Solomon et al. [18]	17 / F	Not reported	Chest, back	Isotretinoin for 18 weeks + 10% lactic acid lotion thereafter	Complete response at 18 weeks; lesions remained clear at 19 months	No response to prior Minocycline treatment
Erkek et al. [6]	48 / F	European	Intermammary, interscapular, abdomen, buttocks	Isotretinoin 0.25 mg/kg/day on alternate days	Resolved after 2 months	Treatment discontinued at 2 months
Matanguihan et al. [19]	25 / F	Filipino	Trunk, nape, flexural areas	Isotretinoin 0.2 mg/kg/day for 6 months	Resolved within 2 weeks	Endocrine disorders ruled out before treatment

M: male; F: female

Isotretinoin is known to inhibit keratinization and reduce sebaceous gland activity; however, its use requires caution in females due to its teratogenic potential [20]. A systematic review reported that 4 out of 6 CARP cases treated with oral isotretinoin demonstrated

favorable outcomes after an average treatment duration of 150 days [21]. Despite these findings, there are no established guidelines regarding the optimal dosing or duration of therapy. Reported regimens vary widely, ranging from 0.2 to 2.0 mg/kg/day for periods of 2 to 6 months. A similar case involving a Filipino patient treated with a low dose of isotretinoin (0.2 mg/kg/day) for 6 months reported excellent clinical improvement without adverse events [19]. In the present case series, the authors initiated treatment with oral isotretinoin at 0.1 mg/kg/day, consistent with their clinical approach of starting at a lower dose before titrating upward. Both the authors and patients were satisfied with the treatment response, with significant clinical improvement observed by 24 weeks.

This case series adds to the growing body of evidence supporting oral isotretinoin as an effective treatment option for CARP. Notably, there remains a paucity of published reports involving Filipino female patients, making these findings an important contribution to the literature.

Conclusion

CARP is a distinct clinical entity characterized by hyperpigmented, reticulated patches and plaques, commonly affecting the nape, upper trunk, and intertriginous areas. Diagnosis can be challenging due to its clinical similarity to other hyperpigmented dermatoses, particularly AN. Histopathologic features alone are often insufficient for differentiation, so clinicpathologic correlation that integrates patient history, physical examination, histological findings, and relevant laboratory investigations is essential.

With growing concerns over antibiotic resistance, there is an increasing need for alternative therapies. Findings from this case series suggest that low-dose oral isotretinoin is a safe and effective treatment option for CARP, producing favorable clinical outcomes without significant adverse effects. To the best of the authors' knowledge, this represents one of the most recent documented reports of CARP successfully treated with isotretinoin in persons of color, particularly Filipino female patients.

Acknowledgement

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Potential Conflict of Interest

The authors declare no potential conflicts of interest.

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CASE REPORT

Brown Macules, Papules, and Nodules in A Filipino Infant: A Case Report of Polymorphic Maculopapular Cutaneous Mastocytosis

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Abstract: Polymorphic maculopapular cutaneous mastocytosis (pMPCM) is the most common form of cutaneous mastocytosis (CM) in children, characterized by polymorphic brown to red oval lesions, plaques, and nodules that often appear asymmetrically. Although primarily confined to the skin, it may present with a range of clinical manifestations. These lesions can be mistaken for other hyperpigmentation disorders, such as café-au-lait spots, drug eruptions, or idiopathic eruptive macular pigmentation. Here, we report a case of pMPCM in a Filipino infant, highlighting the diagnostic challenges and emphasizing the clinical, histopathological, and therapeutic aspects of the disease. This case illustrates practical diagnostic and clinical approaches that may aid clinicians in identifying pediatric mastocytosis, even in resource-limited settings where advanced testing is unavailable.

Keywords: Polymorphic maculopapular cutaneous mastocytosis; Mastocytosis in children; CD117 immunohistochemistry; Pediatric hyperpigmentation disorders

Introduction

Polymorphic maculopapular cutaneous mastocytosis (pMPCM) is the most common form of cutaneous mastocytosis (CM) in children, typically appearing within the first few weeks to six months of life as brown-red macules, plaques, and nodules of varying shapes and sizes. Unlike the monomorphic variant, which appears later in childhood with smaller lesions predominantly on the trunk, pMPCM is more variable in presentation. It involves clonal mast cell proliferation confined to the skin, with a generally favorable prognosis. Mutations of the KIT gene have been associated with CM, but studies have found them to be less common in children than in adults [1]. Lesions may change over time, with blistering commonly observed in infancy and typically resolving by early childhood. While most cases regress by adolescence, some may evolve into residual anetoderma-like lesions following lesion involution [2].

From 2011 to 2023, the Philippine Dermatological Society Health Information Systems recorded only four cases of CM in infants

under one year of age, and 24 cases in children aged 1 to 10 years. None were specifically identified as pMPCM, highlighting the rarity of this variant in Filipino children. This report presents a case of pMPCM in a Filipino infant, emphasizing the clinical, histopathological, and therapeutic aspects, as well as the diagnostic challenges posed by limited access to diagnostic tools such as serum tryptase testing, immunohistochemistry, and genetic analysis in the Philippines.

Case Presentation

A 1-year-and-9-month-old Filipino male presented with widespread cutaneous lesions, including macules, patches, papules, and plaques. He was born full-term via spontaneous vaginal delivery but was admitted for neonatal sepsis due to prolonged rupture of membranes. At 4 months of age, brown macules appeared on his extremities, gradually progressing into papules and plaques by the age of one, involving the face, trunk, and limbs. Some lesions developed into bullae, which ruptured and left residual scars. The patient had been prescribed cetirizine 5 mg once daily; however, this was associated with a further increase in lesions, although these typically subsided within a few days. No other triggers were identified, and an allergy workup was not performed due to limited accessibility. No topical treatments were used at the time. The patient experienced an episode of acute gastroenteritis with mild dehydration at 7 months of age but had no history of systemic allergic reactions, anaphylaxis, or symptoms suggestive of systemic mast cell activation. There was no family history of similar dermatologic conditions.

Dermatologic examination revealed multiple brown macules, patches, papules, plaques, vesicles, and bullae—some of which were ruptured—with residual scarring over the face, trunk, and limbs, as shown in **Figure 1**. The Darier sign was positive, indicating mast cell mediator release, and is considered pathognomonic for CM [2]. The presence of a positive Darier sign, along with the characteristic skin lesions, fulfills the major diagnostic criteria for CM [3]. No hepatosplenomegaly, lymphadenopathy, or other systemic abnormalities were observed.

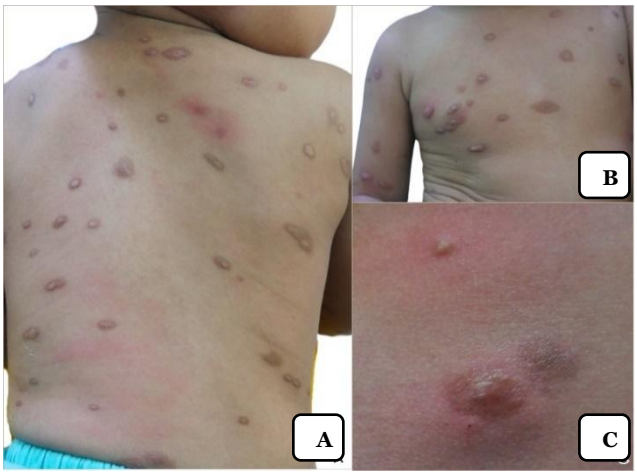

Figure 1. Cutaneous examination showing: **(A)** hyperpigmented and erythematous macules, patches, and plaques with a positive Darier's sign; **(B)** hyperpigmented and erythematous macules, patches, and plaques; and **(C)** a papule and a ruptured bulla on an erythematous background.

Hematoxylin and eosin (H&E) staining and immunohistochemistry were performed on the skin biopsy sample. The findings revealed a dense, pandermal infiltrate of round mast cells with predominant perimembrane CD117 staining, as shown in **Figure 2**, confirming the diagnosis of pMPCM. Additional immunohisto-chemical markers, such as CD2, CD25, and CD30, were not assessed, as CD2 and CD25, in particular, are not readily available in the Philippines. Laboratory investigations, along with abdominal ultrasonography, ruled out extracutaneous involvement.

The patient was treated with loratadine 5 mg taken once daily, desonide cream 0.05% applied twice daily to macules and patches, and clobetasol cream 0.05% applied twice daily to plaques and nodules. As previously noted, the lesions flared with cetirizine 5 mg, prompting a

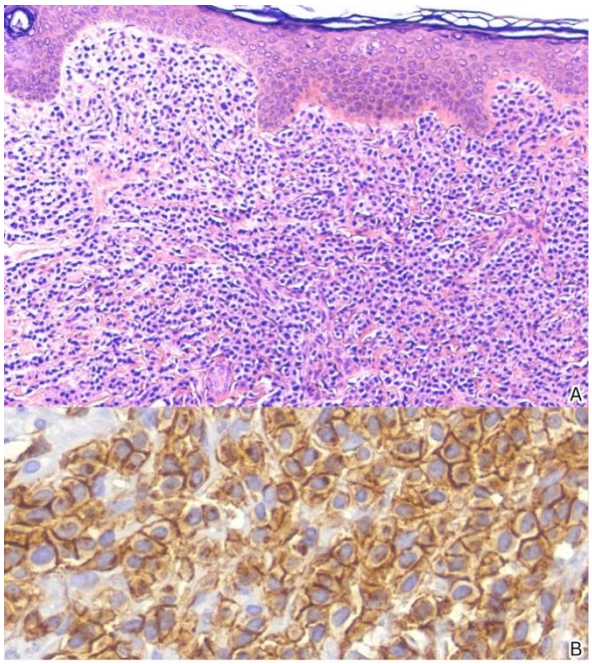

Figure 2. (A) Histopathology showing very dense infiltrate of round shape mast cells (H & E x 200) and **(B)** predominant perimembrane c-KIT immunohistochemical staining of the mast cells (CD 117 x 400).

switch to loratadine. After 8 months, the patient showed significant improvement, with reduced lesion size and fewer episodes of blistering. He remains under close monitoring through monthly skin examinations and assessments for signs of systemic involvement. At 2 years and 5 months of age, the patient exhibits residual hyperpigmentation with no new lesions. A speech delay has also been noted, warranting further evaluation.

Discussion

pMPCM presents a diagnostic challenge due to its diverse clinical manifestations and potential overlap with other dermatologic conditions, especially disorders of hyperpigmentation in children such as café au lait macules, drug eruptions and idiopathic eruptive macular pigmentation.

Serum tryptase testing and peripheral blood KIT mutation analysis (e.g., KIT D816V) are recommended tools for assessing disease burden and the risk of systemic involvement in children with CM. Elevated tryptase levels (>20 ng/mL) may indicate an increased mast cell burden, systemic involvement, or other conditions such as anaphylaxis or hereditary alpha-tryptasemia. Detection of the KIT D816V mutation helps identify patients who may require further evaluation and monitoring. Bone marrow (BM) biopsy is reserved for those presenting with organomegaly, significant peripheral blood abnormalities, markedly elevated or rising tryptase levels, or gastrointestinal symptoms, to confirm systemic mastocytosis or to detect other myeloid neoplasms. Elevated tryptase levels alone are insufficient to warrant a BM biopsy for further confirmation of the diagnosis [2-4].

Given the limited availability of serum tryptase testing and genetic analysis locally, clinicians must rely on alternative diagnostic strategies to confirm the diagnosis of pMPCM. This underscores the critical importance of comprehensive clinical assessment and histopathologic evaluation in establishing the diagnosis. Since pediatric mastocytosis is typically limited to the skin and lacks systemic or hematologic involvement, diagnosis can be made based on clinical assessment. This includes careful evaluation of lesion morphology, number, size, color, distribution, and the presence of a positive Darier's sign [3]. The characteristic Darier sign—a wheal-and-flare reaction elicited by rubbing a lesion—serves as an important clinical clue for the diagnosis of CM [2].

When available, histopathologic stains such as toluidine blue, Giemsa, and CD117 immunohistochemistry can confirm mast cell infiltration and further support the diagnosis [4]. Histologically, pMPCM typically demonstrates a dense infiltrate of round or cuboidal mast cells, whereas monomorphic CM is characterized by fewer, spindle-shaped mast cells. Staining with toluidine blue, Giemsa, and antibodies against CD117 or tryptase aids in identifying subtle mast cell infiltrates. CD2 and CD25—markers associated with systemic mastocytosis—are often

negative in cutaneous mast cells. CD30, although frequently positive in childhood-onset CM and systemic mastocytosis, does not correlate with clinical subtype or disease progression [4].

Most cases of childhood pMPCM have a favorable prognosis [5], with spontaneous regression of lesions typically occurring by puberty [6]. However, the presence of blistering during infancy, widespread lesion distribution, and systemic symptoms may indicate a more severe disease course [7]. In the present case, the absence of extracutaneous involvement suggests a cutaneous-limited form of the disease, with symptomatic management remaining the primary therapeutic goal.

Management of pMPCM centers on minimizing mast cell degranulation, alleviating pruritus, and avoiding known triggers such as heat, friction, and certain medications—including NSAIDs, dextromethorphan, opioids, and muscle relaxants [4]. This is because, in mastocytosis, mast cell activation—often via IgE receptors or triggered by stimuli like heat, stress, or specific drugs—leads to the release of mediators responsible for symptoms such as pruritus, flushing, and blistering. Therefore, avoiding these triggers is essential to minimize mast cell degranulation and reduce symptom flares [2]. Other treatment options include oral H1 antihistamines to relieve itching and flushing, H2 antihistamines to manage gastrointestinal symptoms [6], and oral cromolyn sodium for gastrointestinal involvement [4]. In more severe cases, such as diffuse bullous disease or life-threatening forms, oral methoxypsoralen combined with long-wave ultraviolet A (PUVA) therapy may be considered [8]. Additionally, high-potency topical corticosteroids and calcineurin inhibitors can help reduce cutaneous inflammation [4,9].

Long-term follow-up is essential for monitoring disease progression and identifying potential systemic involvement, as approximately 10% of pediatric mastocytosis cases persisting beyond adolescence may develop into systemic disease. Risk factors warranting further evaluation include monomorphic lesion morphology, persistence of cutaneous lesions after puberty, late onset, lymphadenopathy, hepatosplenomegaly, and abnormal laboratory findings [9].

In this case, the lesions flared following the intake of cetirizine during a previous treatment course. Cetirizine contains methyl parahydroxybenzoate (methyl paraben), which has been shown to sensitize mast cells by increasing intracellular calcium levels, thereby promoting degranulation [10]. Additionally, it activates transient receptor potential ankyrin 1 (TRPA1) channels, exacerbating neurogenic inflammation and pruritus [11]. Similar to certain local anesthetics, parabens may trigger mast cell activation and inflammation [12], likely explaining the patient's paradoxical lesion flare despite antihistamine therapy.

A speech delay was also noted in this patient, prompting further evaluation in light of reports suggesting potential neurodevelopmental impacts in pediatric CM. Although a direct causal relationship has not been established, some cases have reported motor and intellectual delays associated with GNB1 mutations [13], as well as MRI findings indicative of delayed myelination [14]. These observations raise the possibility of neurodevelopmental involvement in a subset of patients. However, in this case, no neuroimaging or genetic testing has been performed to date, underscoring the need for further assessment.

Conclusion

This case highlights the polymorphic presentation of CM in a Filipino infant—an underreported population—underscoring the importance of recognizing its diverse morphology to ensure accurate diagnosis and management. Despite a delayed diagnosis at 1 year and 9 months of age, individualized treatment resulted in significant clinical improvement, emphasizing the importance of

tailored care even when diagnosis is not made during early infancy. The unexpected exacerbation of lesions with cetirizine intake also brings attention to the potential impact of excipients in pediatric patients with mast cell disorders. Additionally, the observed speech delay raises important questions about possible neurodevelopmental associations, warranting further investigation.

This case demonstrates that an accurate diagnosis of pediatric CM is achievable even in resource-limited settings through detailed clinical assessment, recognition of characteristic lesions, and histopathologic confirmation, highlighting the critical role of clinical expertise. Furthermore, this case contributes to the limited local data on pediatric mastocytosis and underscores the need for improved access to diagnostic tools, as well as longitudinal studies to better understand clinical outcomes, refine diagnostic criteria, and guide evidence-based management across diverse pediatric populations.

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Potential Conflict of Interest

The authors declare no potential conflicts of interest.

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CASE REPORT

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

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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 hypo-pigmentation, and post-inflammatory hyper-pigmentation (PIH) [9].

Interactions between vascular structures and perivascular melanocytes in ABNOM lesions may significantly contribute to hyper-pigmentation [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/cm²)
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

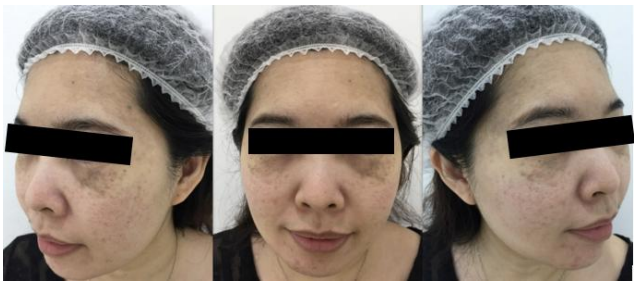

Figure 1. Photograph of the patient before treatment, with visible pigmentation over the temporal and periorbital areas.

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.

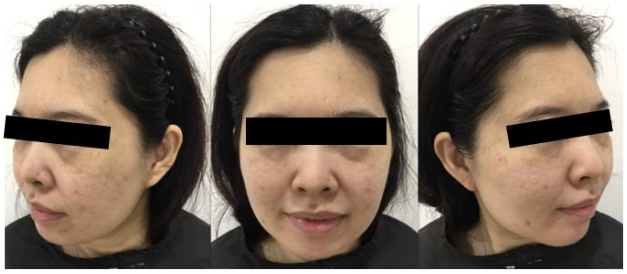

Figure 2. Photograph of the patient after 10 sessions, showing notable cosmetic improvement in pigmentation on both temporal and periorbital areas.

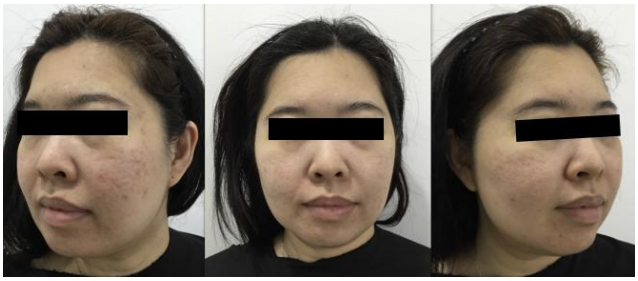

Figure 3. Photograph of the patient after 17 sessions of treatment, showing further improvement in pigmentation on the temporal and periorbital areas.

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.

Acknowledgement

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We also acknowledge the clinic staff for their assistance in coordinating patient care and data collection, which played a critical role in ensuring the smooth progression of this case study.

Potential Conflict of Interest

The author declares no potential conflicts of interest.

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CASE REPORT

Chromatic Curiosity: A Rare Case of Amyloidosis Cutis Dyschromica

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Abstract: Amyloidosis cutis dyschromica (ACD) is a rare form of primary cutaneous amyloidosis, first described by Morishima in 1970. Fewer than 100 cases have been documented in medical literature, with under 10 patients reported from the Philippines. It presents as widespread macular, reticular hyperpigmentation and hypopigmentation, often appearing before puberty and accompanied by focal subepidermal amyloid deposits. We report a case of ACD in a 35-year-old Filipino woman presenting with asymptomatic dyschromic skin lesions, with the primary aim of aiding dermatologists in recognizing this rare but benign condition.

Keywords: Amyloidosis cutis dyschromica, Cutaneous amyloidosis, Dyschromia, Hyperpigmentation, Hypopigmentation, GPNMB mutation

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Introduction

Amyloidosis cutis dyschromica (ACD) is a rare form of primary cutaneous amyloidosis characterized by localized hyperpigmentation and hypopigmentation. First described by Japanese dermatologist, Morishima in 1970, fewer than 100 cases have been reported in the medical literature [1]. This condition presents with (i) widespread macular, speckled, and reticular hyperpigmentation interspersed with hypopigmented spots; (ii) minimal to absent pruritus; (iii) onset before puberty; and (iv) localized deposition of amyloid in the subepidermal region. [2]. In the Philippines, fewer than ten cases have been documented, with reports suggesting a higher prevalence in East and Southeast Asia [3]. Limited access to confirmatory histology and low clinical awareness may contribute to underdiagnosis. We present a case of ACD with prepubertal onset of dyschromia and a positive family history. This case report aims to help dermatologists recognize ACD as a rare but benign pigmentary disorder, supporting accurate diagnosis and appropriate counselling.

Case Presentation

A 35-year-old Filipino female domestic worker from Bukidnon, Philippines, born to non-consanguineous parents, presented with hypopigmented and hyperpigmented macules and patches on the trunk and extremities, which initially appeared on the arms at around 5 years of age. Over time, the lesions gradually increased in size and number but were not associated with symptoms such as pain, pruritus, or

photosensitivity. Although asymptomatic and not interfering with daily activities, the lesions were incidentally detected during routine pre-employment medical examinations for overseas deployment. The patient reported a prior consultation with a physician, during which a diagnosis of pityriasis versicolor was made. She was prescribed ketoconazole shampoo; however, no improvement was noted, and she was subsequently lost to follow-up.

The patient had no history of chronic sun exposure, as she mostly stayed indoors, and reported inconsistent use of sun protection. Her birth and developmental milestones were normal. She had no history of other cutaneous conditions or systemic illnesses. A history of similar skin lesions was noted in her maternal grandmother **(Figure 1)**, but no other family members were known to be affected.

Dermatological examination revealed multiple well-defined hypopigmented to depigmented patches and macules on a background of patchy hyperpigmentation over the trunk and upper and lower extremities **(Figure 2a to 2g)**. Dermoscopy showed white structureless areas with irregular borders, along with brown dots, and globules **(Figure 2h).** Systemic examination was unremarkable, and laboratory investigations including complete blood count, liver enzymes, serum chemistries, and chest radiograph were all within normal limits.

A 4-mm punch biopsy was taken from hypopigmented lesions on the back and arm. Histopathological examination with hematoxylin and eosin (H&E) staining revealed a basket-woven stratum corneum. The dermis showed amorphous eosinophilic globules, pigment-laden macrophages, dilated blood vessels, widened papillae, and a mild superficial lymphocytic infiltrate **(Figure 3a, 3b)**. Congo red staining demonstrated amyloid deposits in the papillary dermis **(Figure 3c)**, while direct immunofluorescence (DIF) revealed globular IgG deposits at the papillary dermis **(Figure 3d)**.

Based on the clinical, histopathologic, and immunofluorescence findings, a diagnosis of ACD was established. As the patient reported no symptoms or significant cosmetic concerns related to the dyspigmentation, she was managed conservatively. Supportive treatment with mild soap, emollients, and sunscreen was prescribed to maintain skin barrier integrity, prevent xerosis, and minimize further pigmentary alteration and UV-induced keratinocyte damage that could exacerbate dyschromia or trigger disease progression. Genetic testing was offered to further characterize the inheritance pattern; however, the patient declined additional investigations.

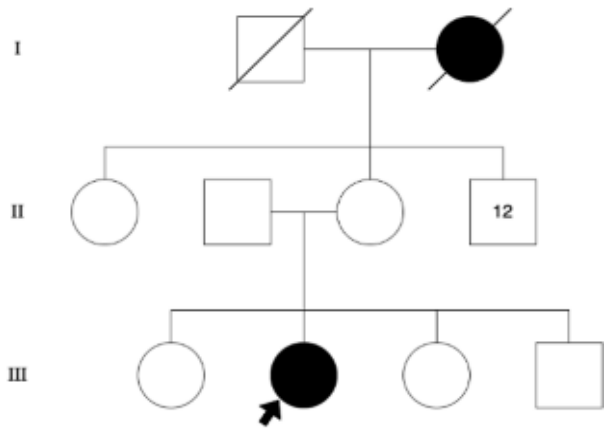

Figure 1. The pedigree for ACD includes a deceased, affected maternal grandmother in the first generation (I). In the second generation (II), the proband's mother is the second of 14 children, with the eldest daughter and 12 younger brothers all unaffected. In the third generation (III), the proband is the second daughter among four siblings, with her older sister, younger sister, and younger brother all unaffected.

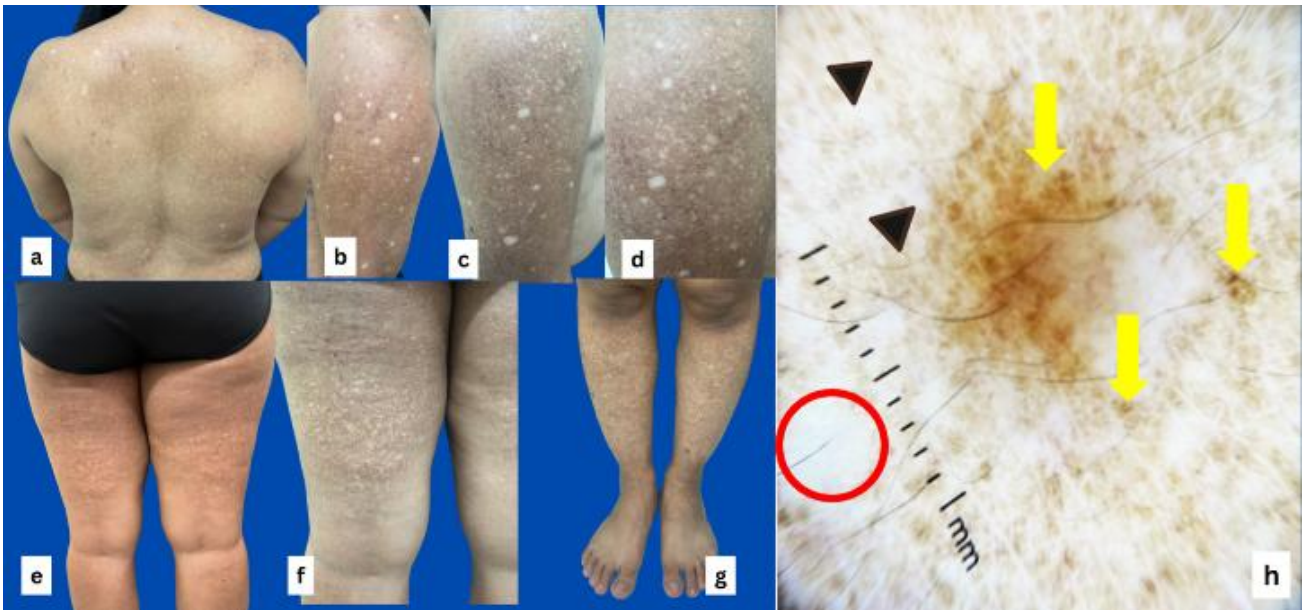

Figure 2. (a–g) Multiple well-defined hypopigmented to depigmented patches and macules on a background of patchy hyperpigmentation affecting the trunk, upper extremities, and lower extremities; **(h)** Dermoscopy reveals white patches with poorly defined margins (red circle), surrounded by small white spots (black arrowheads) and hyperpigmented blotches and patches (yellow arrows).

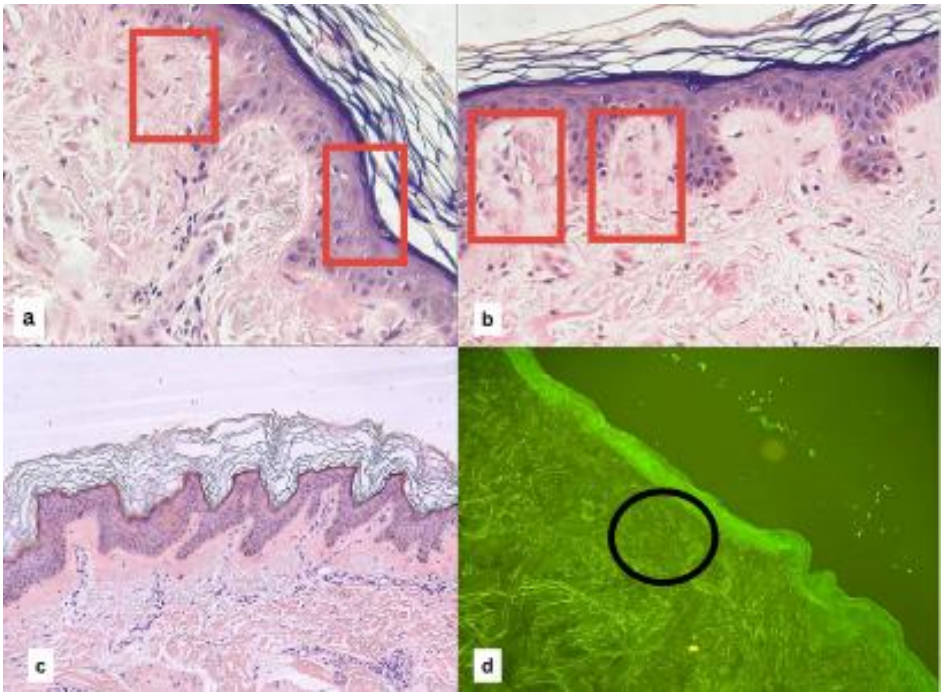

Figure 3. (a, b) Histopathologic examination shows basket-woven stratum corneum, amorphous eosinophilic globules (red box), pigment-laden macrophages, dilated blood vessels, widened papillae, and mild superficial inflammatory infiltrate of lymphocytes in the dermis of the arm and back, respectively; **(c)** Congo red staining demonstrates amyloid deposits in the papillary dermis; **(d)** Direct immunofluorescence reveals globular deposits of IgG in the papillary dermis.

Discussion

ACD affects men and women equally, often presenting prior to puberty, with a mean age of onset of 6 years and a mean age at diagnosis of 30 years [3]. Clinically, ACD manifests as slowly progressive dyschromia, typically sparing the palms, soles, and mucosal surfaces. Facial involvement is rare. Distinguishing features include dotted, reticular, or diffuse hyperpigmentation mixed with hypopigmented macules. The disease results from the deposition of amyloid derived from degenerate keratinocytes, although the exact mechanisms remain unclear. Diagnosis is confirmed through biopsy, which reveals amyloid deposits in the papillary dermis [4].

Among the characteristics of ACD described by Morishima, our patient exhibited all features, including macular, speckled, reticular hyperpigmentation with hypopigmented spots distributed extensively over the body, little or no pruritus, prepubertal onset, and focal subepidermal amyloid deposition confirmed by biopsy. On histopathological examination with H&E, ACD shows amyloid deposits in the papillary dermis as small, amorphous globules of eosinophilic material with Congo red staining demonstrates amyloid deposits in the papillary dermis; DIF reveals globular deposits of IgG in the papillary dermis.

All subtypes of primary cutaneous amyloidosis share amyloid deposition in the papillary dermis; therefore, Congo red and DIF remain valuable tools for confirming amyloid in suspected cases of ACD. In a study by Mehrotra et al. [5], Congo red staining demonstrated a sensitivity of 89.6% and specificity of 100%, while DIF showed a sensitivity of 91.7% and specificity of 100% in cutaneous amyloidosis.

ACD has been postulated to have a genetic component. The majority of cases are associated with autosomal recessive mutations in the GPNMB gene, which encodes glycoprotein non-metastatic melanoma protein B [6,7]. Semidominant mutations, in which some heterozygotes exhibit a milder phenotype, have also been reported [8].

In addition to genetic factors, sun exposure may contribute to ACD pathogenesis. This is because UVB- and UVC-induced keratinocyte damage takes longer to repair in ACD [4,9]. Damaged keratinocytes then undergo apoptosis which release cytokeratins which result in amyloid formation once phagocytosed [10]. However, the role of photosensitivity is debated, as sun-exposed areas often exhibit milder involvement [4]. In our patient, sun-exposed and sun protected areas are equally affected. Genetic testing was offered due to the known gene association, early onset, positive family history, and to assess potential transmission risk to offspring, but it was not performed as the patient declined.

ACD has no known complications, and no effective therapy has been established. Various topical agents and oral supplements have been tried with inconsistent outcomes. Reported treatment options include photoprotection, topical corticosteroids, keratolytics, dimethyl sulfoxide (DMSO), capsaicin, CO_2 laser, and systemic acitretin [2]. Sunscreen is recommended to minimize UV-induced keratinocyte DNA damage, while topical corticosteroids help reduce inflammation. Keratolytics, such as urea or salicylic acid, soften hyperpigmented or hypopigmented macules, flatten papules, and enhance the permeability of active agents. In addition, DMSO and capsaicin may be used to relieve minor pruritus, whereas CO_2 laser therapy reduces amyloid deposits through transepidermal elimination induced by fractional photothermolysis [11]. Among systemic therapies, oral acitretin has been shown to be effective in ACD by inducing apoptosis of damaged keratinocytes, thereby preventing amyloid formation [12].

Conclusion

ACD is a rare, progressive pigmentary disorder with characteristic early-onset dyschromia and subepidermal amyloid deposition. While benign and often asymptomatic, it remains underdiagnosed due to its rarity and clinical overlap with other pigmentary conditions. This case highlighted the importance of clinicopathologic correlation in diagnosing ACD and reinforces the need for awareness among dermatologists to ensure accurate identification, appropriate counseling, and avoidance of unnecessary interventions.

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None

Potential Conflict of Interest

The authors declare no potential conflicts of interest.

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CASE REPORT

Persistent Tattoo Allergy Treated with Q-switched Neodymium: Yttrium Aluminium Garnet (Nd:YAG) Laser

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Abstract: Tattoos are widely used for cosmetic and therapeutic purposes; however, they may lead to adverse reactions. Tattoo allergies can have a substantial impact on the skin and the patient's quality of life. Managing such allergies, particularly in older tattoos containing complex pigments, presents a significant therapeutic challenge. We report the case of a 60-year-old female with a persistent tattoo allergy. Initial treatments with corticosteroids and immunomodulators provided only temporary relief. She subsequently underwent six monthly sessions of Q-switched Neodymium:Yttrium-Aluminium-Garnet (Nd:YAG) laser tattoo removal, which resulted in marked pigment lightening and sustained symptom improvement without adverse effects. This case highlights the efficacy and tolerability of Q-switched Nd:YAG laser therapy as a viable long-term treatment for tattoo allergy.

Keywords: Tattoo allergy, Q-switched Nd:YAG laser, Delayed hypersensitivity reaction, Tattoo complications

Introduction

Tattooing involves implanting permanent pigments and additives into the dermis. While primarily used for cosmetic purposes, it also has therapeutic applications, including camouflaging vitiligo, reconstructing the breast areola after surgery, concealing hair loss, and improving the appearance of surgical scars [1]. The increasing prevalence of tattoos worldwide has been accompanied by a rise in adverse reactions. Adverse reactions may involve impaired wound healing, infections, toxic or potentially mutagenic effects, granulomatous inflammation and allergic reactions. [2] Pigment particles and ink components deposited in the dermis can trigger immune or toxic reactions, often presenting as mild symptoms such as pruritus, swelling, or hair loss within the first month in approximately one in five individuals [3]. More persistent and severe reactions are less common, typically appearing later and affecting about 6%–8% of tattooed individuals [4,5]. The exact prevalence of tattoo allergies in Asia remains unclear; however, one study in India reported 50 allergic reactions diagnosed among 39 patients, with red (53.9%) and black (33.3%) pigments being the most commonly implicated [6]. Management options include topical or intralesional corticosteroids and, in some cases, oral medications such as

hydroxychloroquine or allopurinol. More invasive interventions, such as surgical excision and laser therapy, must be approached cautiously due to the potential risk of permanent scarring [7]. This report describes a case of a 60-year-old female who developed a persistent tattoo allergy following a scar-covering tattoo but achieved successful resolution after treatment with a Q-switched Neodymium:Yttrium-Aluminum-Garnet (Nd:YAG) laser.

Case Presentation

A 60-year-old female presented with pruritus, redness, and scaling over a scar-covering tattoo on her left leg. Fifty years prior to consultation, she sustained an injury that resulted in a scar on the same leg. Two years before presentation, she received a tattoo consisting of a red rose and black leaves to conceal the scar. Two weeks before consultation, she developed induration, erythema, and pruritus (intensity 8/10, interfering with sleep). The lesion progressed to an indurated, thick plaque with excoriations **(Figure 1A)**, suggestive of a tattoo allergy. Clinically, the inflammatory reaction involved areas containing both red and black pigments.

Initial treatment included oral methylprednisolone 16 mg once daily for one week, tapered to 8 mg once daily for the subsequent two weeks, along with clobetasol 0.05% ointment and tacrolimus 0.1% ointment, which provided only temporary relief. She subsequently received intralesional triamcinolone acetonide (20 mg/ml, 0.1 ml injected 1 cm apart for a total of 1.5 ml), but there was no significant improvement in symptoms. A 4 mm skin punch biopsy was performed, revealing epidermal acanthosis with pseudoepitheliomatous hyperplasia and spongiosis **(Figure 2A)**. The dermis demonstrated subepidermal clefting, pigment-laden macrophages, and thickened eosinophilic collagen bundles **(Figure 2B)**. Red and black tattoo pigments were scattered throughout the dermis and surrounded by a dense inflammatory infiltrate of lymphocytes, histiocytes, and plasma cells **(Figure 2C)**. Based on the clinical and histopathological findings, the patient was diagnosed with a tattoo-related allergic reaction.

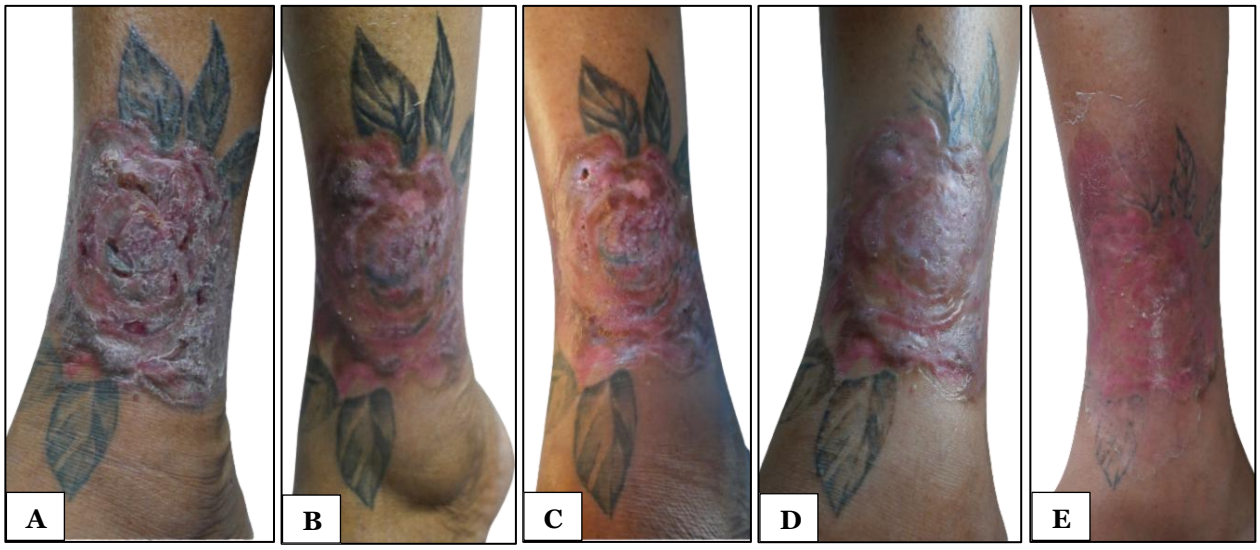

Figure 1. Cutaneous examination showing **(A)** an indurated plaque with excoriations over the tattoo prior to any treatment; **(B)** baseline lesion appearance before the 1st laser session; **(C)** One month after the 6th laser session; **(D)** Two months after the 6th laser session; **(E)** One year after the 6th laser session.

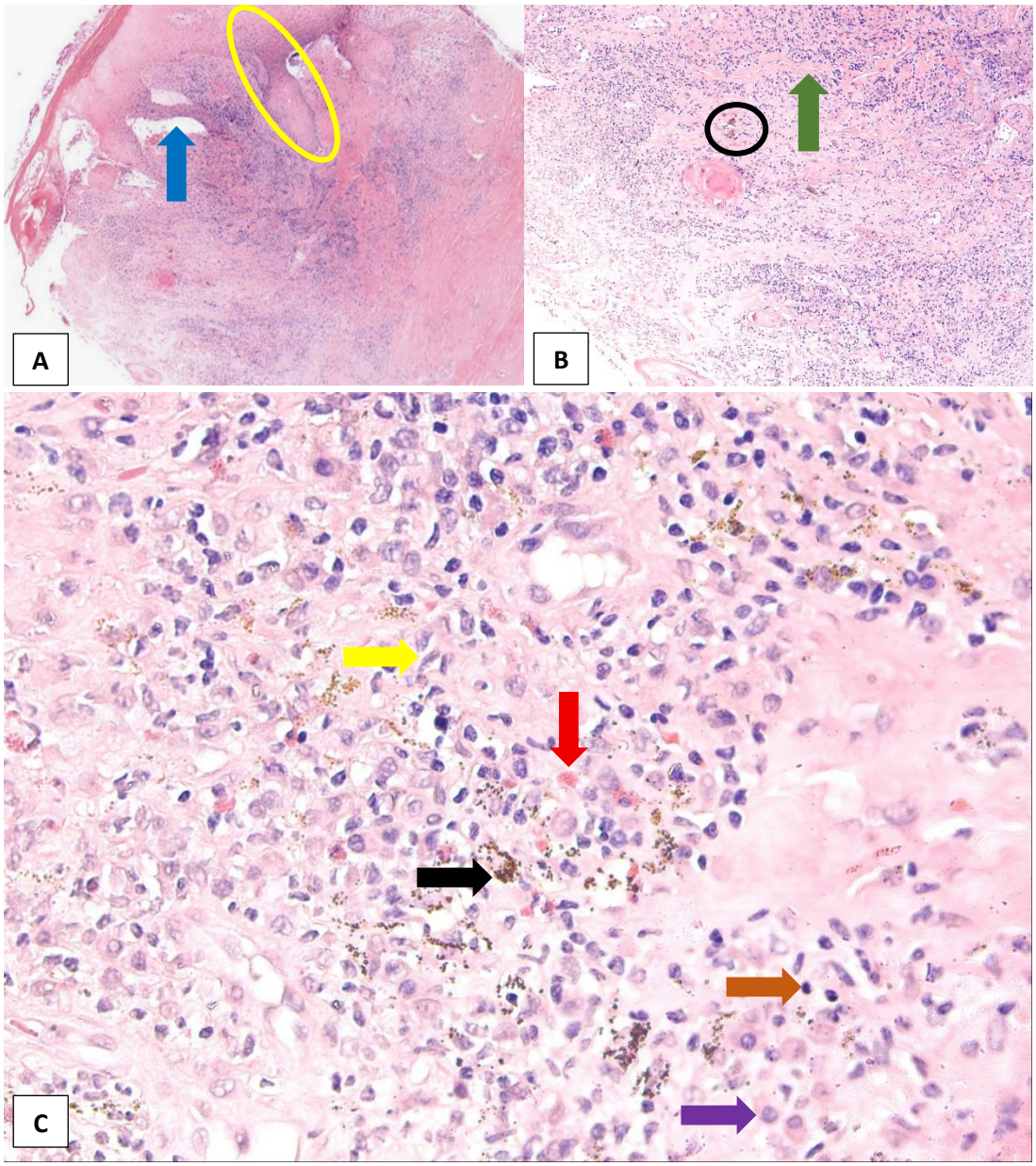

Figure 2. Histopathological examination showing: **(A)** acanthosis of the epidermis with pseudoepitheliomatous hyperplasia (yellow oval) and subepidermal clefting (blue arrow); **(B)** pigment-laden macrophages (black circle) and eosinophilic thickened collagen bundles (green arrow) [H&E, ×100]; **(C)** red tattoo pigments (red arrow) and black tattoo pigments (black arrow) dispersed throughout the dermis, surrounded by a dense inflammatory infiltrate of lymphocytes (orange arrow), histiocytes (yellow arrow), and plasma cells (purple arrow) [H&E, ×400].

Different treatment options were discussed, and the patient opted for laser therapy after the associated risks were thoroughly explained.

She underwent six monthly sessions of Q-switched Nd:YAG laser tattoo removal (Tri-Beam Premium, Jeisys Medical, Korea) under topical anesthesia with occlusion (10.56% lidocaine). A dual-wavelength approach was used: 532 nm (1–1.2 J/cm^2, 4 mm spot size, 2 Hz, 5–10 ns pulse duration, 20% overlap, single pass) for the red pigment, achieving an endpoint of gray

blanching, and 1064 nm (4–6 J/cm², 4 mm spot size, 2–6 Hz, 5–10 ns pulse duration, 20% overlap, single pass) for the black pigment, achieving an endpoint of slight frosting. She was also prescribed oral levocetirizine 5 mg once daily and topical halobetasol 0.05% ointment twice daily.

After each session, there was progressive lightening of the tattoo pigments, along with marked reduction in redness, scaling, and pruritus **(Figure 1B to 1D)**. No post-laser complications were observed. At one-year follow-up after the final laser session, there was significant lightening of the tattoo, resolution of inflammation, and minimal residual pruritus **(Figure 1E)**. Written informed consent was obtained for the publication of clinical details and photographs.

Discussion

Allergic reactions to tattoo pigments typically present with nonspecific symptoms such as tenderness, swelling, and papules or nodules, which may be asymptomatic or pruritic. These reactions are often accompanied by crusting and excoriations resulting from persistent itching. Among all tattoo pigments, red is the color most frequently associated with allergic reactions [8]. Over recent decades, organic pigments such as azo compounds, quinacridones, and phthalocyanines have replaced mineral pigments. Case reports suggest that azo and quinacridone pigments may act as sensitizers, particularly in red tattoos [9]. Delayed hypersensitivity to tattoo ink is possibly caused by long-term ink metabolism or interactions between ink antigens and dermal carrier proteins [10]. However, the exact pathophysiology remains unclear due to the unidentified allergen [10–12].

Allergic reactions to tattoos are classified as late reactions, occurring months or even years after tattooing [13], as seen in our case, where the patient's symptoms appeared two years after the procedure. No pain, increased local temperature, oozing, or ulceration were observed, effectively ruling out infection. While patch testing may be helpful in such cases, tattoo-related allergic reactions are often complicated by frequent false-negative results due to the low dispersibility of tattoo pigments and the difficulty in obtaining suitable test solutions [6]. A definitive diagnosis relies on histopathological evaluation of a skin biopsy, which also assists in differentiating other potential conditions based on characteristic histological patterns [14].

In a study by Silvestre and González-Villanueva [13], interface dermatitis, characterized by a predominantly lymphocytic band-like inflammatory infiltrate, with or without associated spongiotic dermatitis, was reported as a common histological finding in allergic reactions to tattoo ink. This band-like inflammatory infiltrate involves the basal layer of the epidermis and extends into the papillary dermis. In numerous cases, pseudoepitheliomatous hyperplasia is also present, and in more advanced cases, dermal fibrosis is often observed. Similar findings were noted in our case, including pseudoepitheliomatous hyperplasia and spongiosis in the epidermis, subepidermal clefting, pigment-laden macrophages, and red and black tattoo pigments surrounded by a dense inflammatory infiltrate of lymphocytes, histiocytes, and plasma cells. Eosinophilic collagen in the dermis, indicative of dermal fibrosis, was also present. The absence of granulomatous features in our patient supports the exclusion of systemic granulomatous diseases and infectious etiologies.

To date, the treatment and management of tattoo reactions remain challenging [6]. Complete removal of the offending pigment is often necessary to achieve lasting symptom resolution. Initial management typically involves topical or intralesional corticosteroids to alleviate inflammation and control symptoms, though results are often limited and

unsatisfactory. In persistent or severe cases, interventions such as laser ablation or surgical excision may be considered to eliminate the causative allergen, although there is no consensus on the optimal approach. While conventional surgical excision allows for complete removal of dermal tattoo pigments, its use is limited to small tattoos and specific anatomical sites due to the high risk of scarring [12]. Techniques such as dermabrasion or dermatome shaving may alleviate symptoms by removing affected tissue, but they are generally effective only for superficial pigment. More aggressive shaving can result in prolonged healing times and potential scarring [10]. Currently, lasers are the preferred treatment for tattoo removal [15]. In our case, multiple local and systemic immunosuppressive therapies had already been attempted without success, and the patient opted for laser tattoo removal due to the high risk of scarring associated with surgical excision.

The Q-switched Nd:YAG laser is currently considered a highly effective method for tattoo removal, offering excellent results with minimal risk of scarring or hypopigmentation [16–18]. It operates on the principle of selective photothermolysis, wherein a chromophore is heated for a duration shorter than its thermal relaxation time, allowing targeted destruction without damaging surrounding tissue [19,20]. Multi-colored tattoos require lasers with different wavelengths. Studies have shown that the 1064 nm picosecond laser demonstrates superior efficacy for black tattoo removal, while the 532 nm picosecond laser is significantly more effective for red pigments [21].

Allergic reactions to tattoos may be treated using the Q-switched Nd:YAG laser, which targets and removes the offending pigments [7,15]. Previous reports have described the use of Q-switched Nd:YAG lasers for managing tattoo-related allergic reactions, though these cases are limited and primarily focus on red pigments. For instance, van der Bent and van Doorn [7] reported the resolution of a delayed allergic reaction to a red cosmetic tattoo using a 532 nm wavelength combined with oral methotrexate. Lee et al. [15] described a refractory allergic reaction to a red tattoo successfully treated with a picosecond Nd:YAG laser, followed by fractional carbon dioxide laser and intralesional corticosteroid injections. Laser-induced photomechanical breakdown of tattoo pigments may exacerbate immune reactions during treatment [7], though these responses have been successfully prevented in some cases with topical, oral, or intralesional corticosteroids [7,15]. In our case, topical corticosteroids were administered concurrently.

While these cases demonstrate the efficacy and tolerability of laser therapy, a standardized approach to managing tattoo allergy remains undefined. Our case contributes to this limited evidence by demonstrating the successful use of both 532 nm and 1064 nm wavelengths in a patient with allergic reactions to a multicolored tattoo, involving both red and black pigments. No adverse events were noted.

Conclusion

Even though the use of lasers for allergic reactions associated with tattoo removal is well known, a standardized management approach remains undefined. Our case adds to the limited evidence by demonstrating that Q-switched Nd:YAG laser treatment is an effective and well-tolerated option for managing persistent tattoo allergy. Successful treatment was achieved using both 532 nm and 1064 nm wavelengths for a multicolored tattoo involving red and black pigments, with no adverse events observed. Therefore, a trial of Q-switched Nd:YAG laser therapy may be considered in cases of allergic reactions to tattoos that are refractory to medical therapy.

Acknowledgement

None

Potential Conflict of Interest

The authors declare no potential conflicts of interest.

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Pediatric and Adult Hypopigmented Mycosis Fungoides: A Case Report

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Abstract: Hypopigmented mycosis fungoides (HMF) is a rare variant of cutaneous T-cell lymphoma that predominantly affects children and individuals with darker skin. We report two Filipino patients, a 4-year-old girl and a 34-year-old man, who presented with progressive, non-pruritic hypopigmented patches. Histopathology and immunohistochemistry confirmed HMF, revealing CD8+ predominance in the pediatric case and CD3+ epidermotropic cells in the adult. The child demonstrated a favorable response to narrowband UVB phototherapy, while the adult showed early improvement with topical corticosteroids. These cases underscore the importance of considering HMF in persistent hypopigmented dermatoses and highlight the value of clinicopathologic correlation for timely diagnosis and management.

Keywords: Hypopigmented mycosis fungoides, Cutaneous lymphoma, Epidermotropism, Phototherapy

Introduction

Hypopigmented skin lesions are a common concern among patients attending dermatologic outpatient clinics. One of the underlying conditions is mycosis fungoides (MF), the most prevalent form of primary cutaneous T-cell lymphoma (CTCL). MF accounts for approximately 62% of all CTCL cases and is classified as an extranodal non-Hodgkin lymphoma [1].

Hypopigmented MF (HMF) is a clinical variant of MF [2]. HMF is more common in individuals with darker skin phototypes, including those of African, South Asian, Middle Eastern, and Hispanic descent, where the lesions are more clinically apparent [3,4]. Most studies report an approximately 1:1 female-to-male ratio [5]. HMF tends to occur at a younger age, with cases described in children, adolescents, and young adults [6], including infants as young as six months [7].

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Clinically, HMF usually presents as circular or irregular hypopigmented patches or thin plaques with fine scaling. These lesions are often asymptomatic or only mildly pruritic and are most commonly located on the torso, buttocks, and extremities. Diagnosis can be challenging and is often delayed due to the disease's slow progression and resemblance to other hypopigmented conditions, such as vitiligo, tinea corporis, pityriasis versicolor, pityriasis alba, post-inflammatory hypopigmentation, progressive macular hypomelanosis, and leprosy [8]. Consequently, HMF is frequently overlooked, leading to delays in treatment.

This case report aims to highlight the essential role of clinicopathologic correlation in the timely diagnosis and management of HMF. Additionally, it seeks to contribute to the limited literature on this rare condition by detailing its clinical presentation, diagnostic approach, and management.

Case Presentation

Case 1: A 4-year-old Filipino girl presented with a 3-year history of hypopigmented macules and patches involving the face, trunk, buttocks, and bilateral upper and lower extremities. The lesions initially appeared as erythematous plaques on the trunk. Dermatologic examination revealed multiple hypopigmented macules and patches distributed over the face, trunk, back, gluteal region, and extremities **(Figure 1A).**

Routine investigations, including complete blood count, peripheral blood smear, liver and renal function tests, lactate dehydrogenase, and chest radiograph, were within normal limits. A 4-mm skin punch biopsy was performed twice. The repeat biopsy showed basket-weave orthokeratosis, a few lymphocytes along the dermoepidermal junction with focal epidermal collections, and a moderately dense superficial perivascular infiltrate composed of lymphocytes and melanophages. Immuno-histochemistry (IHC) revealed CD4 and CD8 highlighting epidermotropic and atypical cells in the epidermis, with CD8 predominance over CD4 and focal loss of CD7—findings consistent with HMF **(Figure 1B)**.

The patient was treated with narrowband UVB phototherapy, initiated at 300 mJ/cm² with a 10% incremental increase per session three times weekly, resulting in areas of repigmentation after three months **(Figure 1C)**.

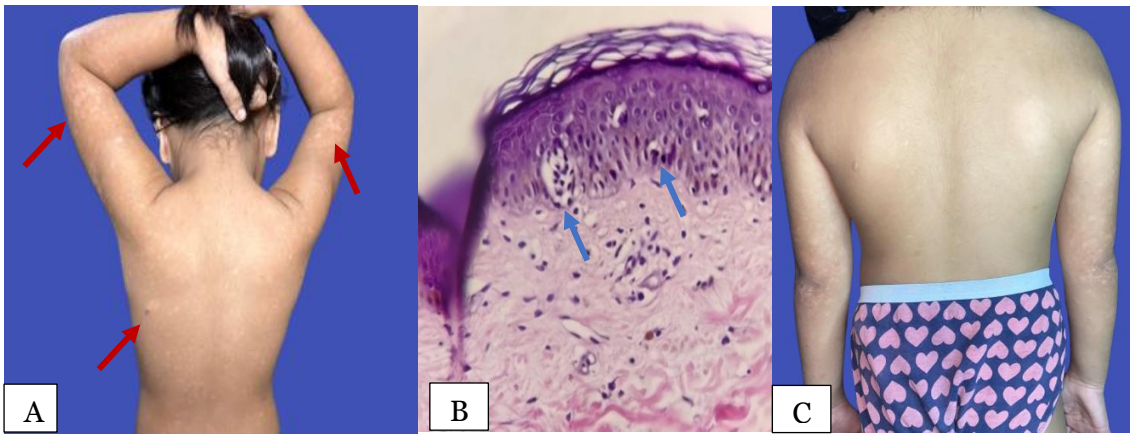

Figure 1. (A) Dermatologic examination showing multiple hypopigmented macules and patches on the trunk of the 4-year-old female (red arrows); **(B)** Histopathologic sections (H&E) demonstrating a focal collection of vacuolated cells at the dermoepidermal junction, with a few cells exhibiting epidermotropism (blue arrow); **(C)** Reduction in the number of hypopigmented lesions following narrowband UVB therapy.

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Case 2: A 34-year-old Filipino man presented with a 5-year history of non-pruritic hypopigmented patches, which initially appeared on the bilateral upper extremities and gradually increased in size and number, eventually spreading to the trunk and bilateral lower extremities. Dermatologic examination revealed multiple hypopigmented macules and patches on the trunk and extremities **(Figure 2A).**

Routine investigations, including complete blood count, liver and renal function tests, and chest radiograph, were normal. A 4 mm skin punch biopsy was performed three times, with the third biopsy demonstrating superficial perivascular dermatitis. Histopathologic examination revealed basket-weave orthokeratosis, basal layer hyperpigmentation, subtle epidermotropism, and a focal collection of vacuolated cells at the dermoepidermal junction. A mild superficial perivascular infiltrate composed of lymphocytes, histiocytes, and melanophages was also noted. Immunohistochemistry highlighted epidermotropic and atypical epidermal cells with CD3 staining, findings consistent with HMF **(Figure 2B)**. Due to financial constraints, CD4 and CD8 staining were not performed, and CD3 staining was carried out to support the diagnosis.

Phototherapy was not feasible due to the patient's work schedule and distance from the hospital. Consequently, he was started on clobetasol propionate 0.05% lotion applied twice daily, with minimal repigmentation observed on the trunk and extremities after one month of treatment. The patient was, however, lost to follow-up.

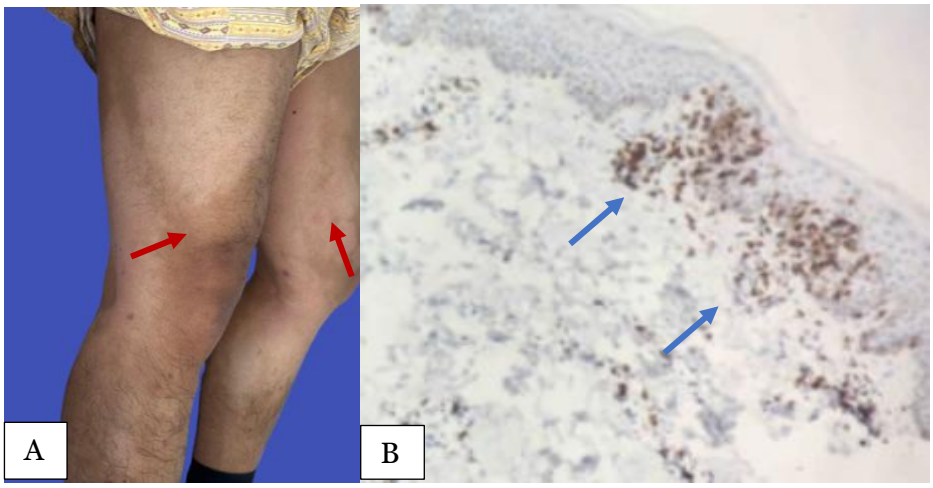

Figure 2. (A) Dermatologic examination showing multiple hypopigmented patches on the lower extremities of the 34-year-old male (red arrows); **(B)** Immunohistochemistry with CD3 demonstrating epidermotropic and atypical cells in the epidermis (arrow).

Discussion

HMF is a distinct variant of mycosis fungoides characterized by infiltration of cytotoxic CD8+ T lymphocytes in the skin, which target melanocytes and lead to pigment loss [9]. This immunopathogenic mechanism underpins the hallmark hypopigmented lesions observed predominantly in children, adolescents, and young adults, as seen in the 4-year-old girl and the 34-year-old man presented. HMF poses significant diagnostic and therapeutic challenges. The chronicity of lesions, their distribution, and subtle symptoms such as pruritus or atrophy may mimic benign dermatologic conditions, often delaying diagnosis, as evident in both cases where a prolonged history preceded diagnosis.

Diagnosis of HMF relies on clinicopathologic correlation [9], with histopathology and immunohistochemistry being

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equally important for confirmation. Immunohistochemical analysis is particularly valuable because neoplastic cells in HMF often express CD8, a hallmark feature of this variant [5]. Unlike classical MF, which is characterized by epidermotropic CD4+ T cells, hypopigmented MF typically shows a predominance of CD8+ cells [8].

In a retrospective review of 67 patients with CD8+ MF, 20.9% presented with hypopigmented lesions [10]. Similarly, Koikkara et al. found CD8+ predominance in 56% of cases, and Rodney et al. observed a CD8+ predominant infiltrate in 58.3% of patients [4,11], supporting the notion that HMF is a CD8+-predominant variant of MF. Partial loss of CD7 has also been reported in some cases [12]. This was evident in our first case, which demonstrated CD8 predominance and partial CD7 loss, consistent with literature linking CD8+ cytotoxic T cells to melanocyte destruction and hypopigmentation. In the second case, immunohistochemistry revealed CD3+ epidermotropic cells, in line with findings by Nazareth, who reported that neoplastic cells in HMF express CD3, a pan–T-cell marker [13]. Koikkara also found CD3 positivity in all patients evaluated [11].

First-line management for HMF includes phototherapy, such as narrowband ultraviolet B, and photochemotherapy (psoralen and ultraviolet A [PUVA]), often combined with topical agents including corticosteroids, retinoids, imiquimod, or nitrogen mustard [6]. Successful outcomes with NB-UVB combined with topical corticosteroids have been reported [8]. Early-stage HMF generally responds well to skin-directed therapies. In the pediatric case, narrowband ultraviolet B led to notable repigmentation within three months, affirming its efficacy. Adults may require alternative or adjunctive therapies, particularly when phototherapy is impractical, as demonstrated by the second patient, who showed minimal improvement with topical clobetasol.

Prognostically, stratification and clinical staging remain the most reliable indicators for MF. HMF carries an excellent prognosis, especially in pediatric populations, with low rates of progression to advanced disease. Although relapse of hypopigmented lesions during treatment is relatively common, disease progression remains uncommon [14]. Regular follow-up is essential to monitor treatment response and detect any early signs of progression.

Conclusion

This report highlights two rare cases of HMF in Filipino patients, one pediatric and one adult, underscoring the clinical variability and diagnostic challenges of this condition. Early-stage HMF may present with hypopigmented patches that mimic benign skin disorders, often delaying diagnosis and treatment. Histopathologic and immunohistochemical studies, particularly the presence of CD8+ epidermotropic lymphocytes, remain essential for accurate identification. Both cases demonstrated favorable early responses to treatment, reinforcing that HMF generally carries an excellent prognosis. Therefore, a high index of suspicion is necessary in patients with persistent hypopigmented patches, especially in covered areas. Timely recognition, appropriate diagnostic work-up, and individualized management strategies are crucial for improving outcomes in patients with HMF.

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Potential Conflict of Interest

The authors declare no potential conflicts of interest.

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Contribution of Authors

All authors critically reviewed and revised the manuscript and approved the final version.

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CASE REPORT

Multi-Wavelength Laser Treatment for Nevus Spilus: A Promising Approach

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Abstract: Nevus spilus (NS), or speckled lentiginous nevus, is a pigmented skin lesion characterized by darker macules within a lighter brown patch. Managing NS is challenging due to its cosmetic impact, recurrence risk, and the need for selective pigment targeting without scarring. Among available treatment modalities, the Q-switched Nd:YAG laser (QSNYL) is considered an effective option, as it selectively targets melanin with minimal collateral tissue damage, offering favorable cosmetic outcomes. We report the case of a 37-year-old woman with NS presenting as hyperpigmentation on the preauricular region. The first two sessions of combination treatment with 660 nm and 1064 nm QSNYL resulted in post-inflammatory hyperpigmentation (PIH), which progressively worsened after the third and fourth sessions with 532 nm and 1064 nm QSNYL. Treatment was subsequently switched to the 1064 nm wavelength alone, which led to improvement of both the NS lesion and PIH, with no adverse effects. This case highlights the potential role of QSNYL in the management of NS.

Keywords: Nevus Spilus, Q-switched Nd:YAG 1064nm laser, Post-inflammatory hyperpigmentation

Introduction

Nevus spilus (NS), also referred to as speckled lentiginous nevus (SLN), is a relatively common dermatological finding characterized by numerous small, pigmented macules or papules scattered over a uniformly pigmented patch. It may be present at birth or develop later in life, although its underlying cause remains unclear [1]. Typically, NS lesions are small, with the background café-au-lait area measuring approximately 1–4 cm in diameter, while the superimposed darker macules range from 1–6 mm. However, in some cases, NS may present as a large unilateral patch or in a more extensive form involving broader areas of the body [2]. When the lesion exceeds 20 cm^2—referred to as the giant variant—it can cause significant cosmetic concerns and pose notable treatment challenges [3].

NS commonly presents at birth or within the first month of life and is therefore considered a congenital nevus, affecting both sexes equally [4-6]. Initially, it may appear as subtle tan macules during infancy or early childhood but gradually progresses into more prominent pigmented macules and papules over time, displaying black, brown, or reddish-brown hues.

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NS can occur anywhere on the body but most often affects the torso and extremities [7].

Various treatment modalities have been explored for NS, including conventional surgery, chemical peels, mechanical dermabrasion, and both ablative and non-ablative lasers, with varying degrees of success [8,9]. Among these, different types of ablative and non-ablative lasers, used either alone or in combination, have demonstrated promising results [2–4,8]. Q-switched Nd:YAG lasers (QSNYL) at 532 nm and 1064 nm have been reported to achieve clinical improvement in some NS cases [4]. However, these approaches may also lead to complications such as scarring (atrophic, hypertrophic, or keloid) and transient or persistent hypopigmentation or hyperpigmentation [4,10].

In this case report, we describe a patient with NS who developed post-inflammatory hyperpigmentation (PIH) following initial combination laser treatments using 660 nm and 1064 nm QSNYL, and subsequently 532 nm and 1064 nm QSNYL. Treatment was then switched to 1064 nm QSNYL alone, applied using two different settings, which resulted in notable clinical improvement with minimal adverse effects. This case underscores the importance of individualized wavelength selection in reducing the risk of PIH while optimizing therapeutic outcomes.

Case Presentation

A 37-year-old female, with no known medical illnesses (NKMI) and no known drug allergies (NKDA), who is single and employed as a human resources professional, presented with a hyperpigmented lesion on the right preauricular region that had been present for more than seven years. The patient reported that the lesion was longstanding but had not previously sought medical evaluation or treatment, as it remained asymptomatic.

On physical examination, there was a hyperpigmented patch with multiple darker pigmented macules and papules over the right preauricular region. Similar lesions were also observed on the back, chest, and right axilla. This multisite speckled presentation was consistent with the classic morphology of NS, supporting the diagnosis. The patient had a Fitzpatrick skin type III and reported no family history of similar lesions. Additionally, she denied frequent sun exposure and maintained only a basic skincare routine.

Management and Outcome

The patient underwent full-face laser treatments, performed by a single physician, after providing written informed consent. The treatment period spanned from August 2022 to January 2023. Standardized photographs were taken immediately before and after each session using an iPhone camera, positioned in a designated photo corner with consistent lighting to ensure reliable comparisons.

All treatment sessions were performed using a Q-switched Nd:YAG laser (Spectra XT™, Lutronic Corporation, Goyang, Korea) at different wavelengths **(Table 1)**. The initial two sessions were carried out using QSNYL with a combination of 660 nm and 1064 nm wavelengths. The 660 nm QSNYL was set to a 3 mm spot size, 1 Hz frequency, and a fluence range of 0.75–1.4 J/cm², achieving endpoint frosting. The 1064 nm QSNYL was set to a fluence of 1.0 J/cm², 10 Hz frequency, and an 8 mm spot size, with three passes per session. However, after these two combined sessions, the patient developed PIH **(Figure 1)**. She was then prescribed topical hydrocortisone 1%, applied once daily (OD) and continued until the third treatment session to manage the pigmentation.

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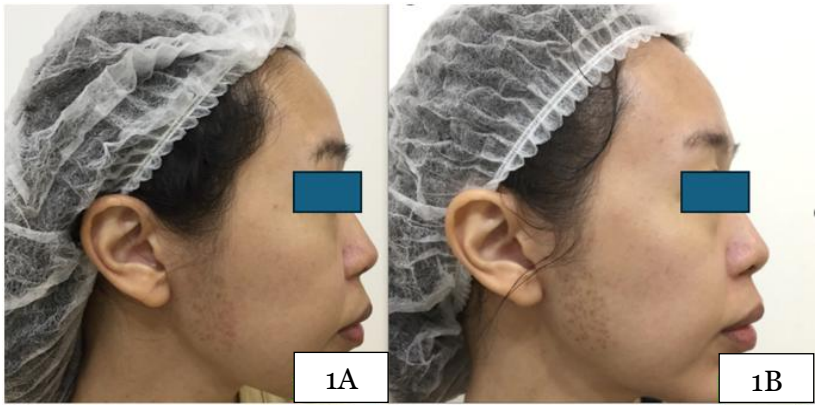

Figure 1. Comparison of the NS lesion between the first session **(A)** and second session **(B)** combination treatment with 660 nm and 1064 nm QSNYL, showing the development of PIH.

Figure 2. Comparison of the NS lesion between the third session **(A)** and fourth session **(B)** of combination treatment with 532 nm and 1064 nm QSNYL, demonstrating the development and worsening of PIH over the NS lesion following the change in treatment protocol.

Subsequently, the treatment protocol was modified to a combination of 532 nm QSNYL and 1064 nm QSNYL for the next two sessions. The 532 nm QSNYL was set to a 3 mm spot size, 1 Hz frequency, and a fluence of 1.4 J/cm², achieving endpoint frosting, while the 1064 nm QSNYL parameters remained unchanged. However, the patient developed worsening PIH following these sessions **(Figure 2)**.

During the fifth session, the treatment approach was adjusted to 1064 nm QSNYL alone using the same initial settings. An additional step was then introduced with a pulse rate of 5 Hz, 4 mm spot size, and a fluence of 4.0 J/cm², applying a pulse stacking technique for 5 to 8 seconds without activating the Pulse-to-Pulse (PTP) mode. After two sessions with this modified protocol, the PIH gradually began to fade **(Figure 3)**. All treatment sessions were conducted at one- to three-month intervals, with close monitoring of skin responses to optimize outcomes and minimize adverse events. The patient was instructed to apply sunscreen daily, avoid direct sun exposure, and maintain adequate skin hydration using moisturizing masks. Over the course of 18 sessions, each lasting approximately 30 minutes, there was a remarkable cosmetic improvement. The NS lesions showed significant lightening, and the PIH progressively improved **(Figure 4)**. Apart from this, the patient experienced no significant adverse effects, such as scarring or hypopigmentation.

Discussion

NS is a pigmented skin lesion typically presenting as a patch containing multiple darker macules or papules [1]. Beyond surgical excision, various laser and light-based modalities have been explored for its management, with treatment outcomes depending largely on lesion characteristics and patient-related factors. Among these, pigment-targeting devices such as

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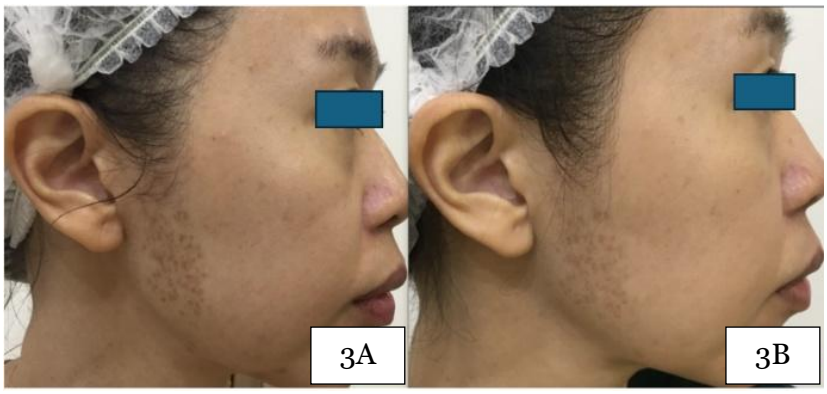

Figure 3. Comparison of the NS lesion between the fifth session **(A)** and seventh session **(B)** of treatment with 1064 nm QSNYL alone, showing progressive fading of PIH after two sessions of treatment.

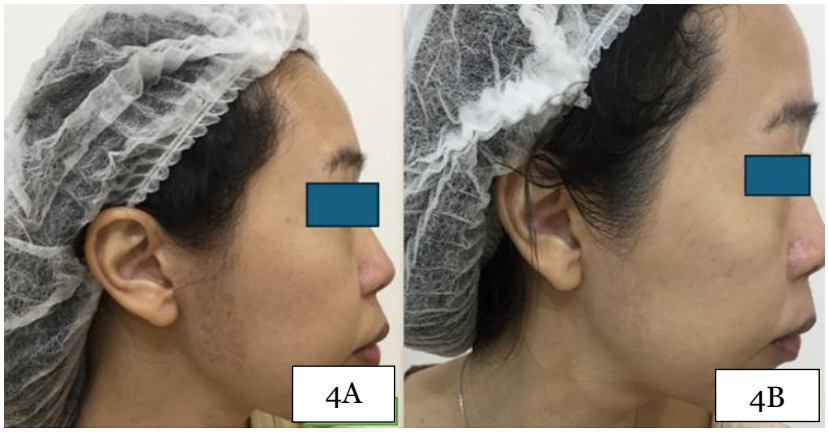

Figure 4. Comparison of the NS lesion prior to treatment **(A)** and after 18 sessions **(B)** with QSNYL, demonstrating significant cosmetic improvement and resolution of PIH.

Table 1. Laser parameters of QSNYL used in the treatment of NS.

Session(s)	Wavelength	Spot Size (mm)	Fluence (J/cm²)	Frequency (Hz)
1–2	QS Nd:YAG 660 nm	3	0.75	1
	QS Nd:YAG 1064 nm	8	1	10
3–4	QS Nd:YAG 532 nm	3	1.4	1
	QS Nd:YAG 1064 nm	8	1	10
5–18	QS Nd:YAG 1064 nm	8	1	10
	QS Nd:YAG 1064 nm	4	4	5

Q-switched ruby, alexandrite, and QSNYL at 532 nm and 1064 nm have demonstrated consistently favorable results [11].

Previous studies have documented successful clearance of NS lesions with QSNYL [4]. The QSNYL is commonly utilized in various dermatological treatments due to its ability to effectively target dermal pigments, including tattoo ink and benign pigmented skin lesions. Its action is based on the principle of selective photothermolysis, which enables precise pigment destruction while minimizing damage to the surrounding tissues [12].

The wavelength used plays a critical role in treatment success. Longer laser wavelengths are generally more effective for treating dermal lesions due to their greater penetration depth and reduced absorption by the epidermis. Conversely, superficial epidermal pigmented lesions respond better to shorter wavelengths [12]. For example, the QSNYL utilizes a 532 nm wavelength for targeting superficial

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pigmentation and a 1064 nm wavelength for treating deeper dermal pigments, as well as for improving skin texture and resurfacing [13]. Because NS may involve pigment deposition in both the dermis and epidermis, using different wavelengths can be beneficial.

In our patient, since the pigment in the portion of NS containing the small nevi was located in both the epidermis and superficial dermis, initial combination treatments with 660 nm and 1064 nm QSNYL, followed by 532 nm and 1064 nm QSNYL, were performed. However, this led to the development of PIH. PIH is one of the most frequent adverse effects associated with pigment-targeting laser therapies, especially in individuals with darker skin tones. PIH is typically more persistent and severe in individuals with darker skin tones, particularly those with Fitzpatrick skin types III to VI, due to higher melanin production and increased melanocyte activity [14]. In this case, the patient had Fitzpatrick skin type III, placing them at elevated risk of PIH after QSNYL treatment.

After switching to a protocol using 1064 nm QSNYL alone, applied with two different energy settings, the patient achieved notable clinical improvement with minimal adverse effects. This positive outcome underscores the importance of individualized wavelength selection and careful parameter optimization based on patient-specific factors such as skin type, lesion depth, and pigment density.

Conclusion

This case highlights the potential effectiveness of the QSNYL, particularly the 1064 nm wavelength, in managing NS. Since NS may involve pigment in both the epidermis and dermis, appropriate wavelength selection and parameter adjustment are essential to optimize outcomes while minimizing PIH. Individualized laser protocols tailored to patient-specific factors such as skin type, lesion depth, and pigment distribution can enhance treatment efficacy and safety. Further studies with larger cohorts are needed to establish standardized protocols for NS management.

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Potential Conflict of Interest

The authors declare no potential conflicts of interest.

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CASE REPORT

Neurofibromatosis with Unilateral Segmental Lentiginosis: A Case Report

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Abstract: Neurofibromatosis type 1 (NF1) is a genetic, neuroectodermal, and multisystemic disease caused by NF1 loss-of-function variants with an autosomal dominant inheritance pattern. It leads to developmental abnormalities in neural, osseous, and epidermal tissues, resulting in impaired regulation of cell growth and differentiation, and ultimately in tumorigenesis and non-neoplastic manifestations. We report the case of a 59-year-old Filipino female presenting with papules and nodules on the trunk and extremities, as well as macules and patches on the left side of the face, trunk, and extremities. The lesions had been evolving since birth, with no prior consultations or interventions. This report aims to describe a rare presentation of bilateral segmental NF1 with partial unilateral lentiginosis, contributing to the scarce literature on mosaic NF1 variants in the Philippines.

Keywords: Neurofibromatosis type 1, NF1, Neurofibroma, Von Recklinghausen disease, Lentiginosis, Case report

Introduction

Neurofibromatosis type 1 (NF1) is an inherited neurocutaneous and multisystemic disorder characterized by developmental complications in neural, osseous, and epidermal tissues [1]. Also known as Von Recklinghausen disease, NF1 is a tumor-predisposition syndrome caused by loss-of-function mutations in the neurofibromin 1 gene, arising either through inheritance or de novo events [2].

NF1 follows an autosomal dominant pattern of inheritance, involves multiple tissues, and is clinically characterized by features such as ≥6 café-au-lait macules (CALMs), neurofibromas of any type including plexiform, axillary or inguinal freckling, hamartomatous Lisch nodules of the iris, optic pathway gliomas, and disease-specific bony dysplasia. In addition to benign and malignant tumor development, affected individuals are also at increased risk of musculoskeletal, cardiovascular, and nervous system abnormalities [2].

Mosaicism occurs when a postzygotic gene mutation gives rise to two genetically distinct cell lines within the same individual [3]. Mosaic forms of NF1 may present as segmental, generalized, or gonadal variants [4]. In segmental NF1, clinical manifestations are confined to a specific body region, whereas in generalized NF1, they involve the entire body [1,5].

A systematic review and meta-analysis by Lee et al. estimated the prevalence of NF1 at approximately 1 in 3,164 individuals, with a pooled birth incidence of 1 in 2,662 [6], underscoring its rarity yet global clinical significance. However, in the Philippines, the true incidence and prevalence remain unknown due to challenges in obtaining accurate epidemiological data. Many cases may be underreported or diagnosed late, as early manifestations often appear benign and may delay medical consultation.

This case report presents a rare case of bilateral segmental NF1 with partial unilateral lentiginosis in a 59-year-old female. Documenting this unusual dual presentation adds to the scarce literature on mosaic NF1 variants, highlights atypical patterns that are prone to misdiagnosis, and expands the recognized phenotypic spectrum of NF1. Such reports may also provide insights into shared embryologic and genetic mechanisms underlying its diverse clinical manifestations.

Case Presentation

A 59-year-old female patient presented with papules and nodules on the trunk and extremities, as well as dark pigmentation affecting the left side of the face, trunk, and extremities. The lesions had been present since birth, gradually increasing throughout childhood and extending to involve the trunk and left extremities. Despite the progressive nature of these changes, the patient's family did not seek medical consultation, and no interventions were initiated.

Over time, the areas of hyperpigmentation persisted without significant changes in size or number and were not associated with other symptoms. The patient reported that the lesions remained stable until approximately three years prior to consultation, when she began to notice the gradual development of multiple nodularities over the anterior and posterior trunk and the left upper and lower extremities. The persistence and progression of these lesions prompted medical evaluation.

At presentation, the patient denied visual changes, eye pain, or proptosis, as well as hearing loss or otalgia. She also denied musculoskeletal or neurologic symptoms, including limitations in movement, spinal deformities, dizziness, seizures, or altered sensorium. Family history was notable for skin hyperpigmentation on the maternal grandmother's left thigh; no other relatives were reported to have similar manifestations.

Dermatologic examination revealed Fitzpatrick skin type III, with multiple, well-defined brown macules and patches, largest measuring approximately 2.5 × 4.5 cm, distributed on the left side of the face, trunk **(Figure 1A)**, and left upper and lower extremities. Multiple well-defined, soft, skin-colored, non-pruritic, non-tender papules and nodules were also observed **(Figure 1B)**, several demonstrating the buttonhole sign. These were scattered over the anterior and posterior trunk and the left upper and lower extremities. Additional solitary nodules were noted on both breasts, one of which showed a central black punctum **(Figure 1C).**

Neurologic evaluation revealed intact sensory function, including normal vision and hearing, with motor strength graded 5/5 in all extremities. The remainder of the physical examination was unremarkable. Based on the clinical findings, the initial impression was NF1.

To evaluate the cellular architecture and characteristics of the lesions, a cyto-histopathologic assessment was performed. Skin tissue samples were obtained from two separate lesions: a 4 mm punch biopsy of the hyperpigmented patch and a shave biopsy of the skin-colored papule on the abdomen. The patient was prescribed mupirocin ointment for application to eroded areas twice daily for seven days. Systemic examination findings were unremarkable.

Histopathological analysis revealed elongated rete ridges with basal layer hyperpigmentation, consistent with a melanotic macule. Additionally, both the hyperpigmented macule and the skin-colored papule on the abdomen demonstrated unencapsulated, symmetrical proliferation of spindle-shaped cells with wavy nuclei, consistent with neurofibroma **(Figure 2A to 2D).**

With clinicopathologic correlation, a final diagnosis of bilateral segmental neurofibromatosis with partial unilateral lentiginosis was established. Although genetic sequencing and mammography were advised, the patient declined further diagnostic evaluation, expressing that her primary concern was symptomatic treatment rather than additional investigations

Definitive management was recommended, consisting of ablative laser treatment for the removal of neurofibromas and Q-switched neodymium: yttrium-aluminum-garnet (QS Nd:YAG) laser therapy for the lightening of hyperpigmented macules and patches. However, the patient declined intervention, citing a profound acceptance of her condition and a lack of concern regarding the cosmetic manifestations. Regular screening and periodic follow-up assessments were also recommended.

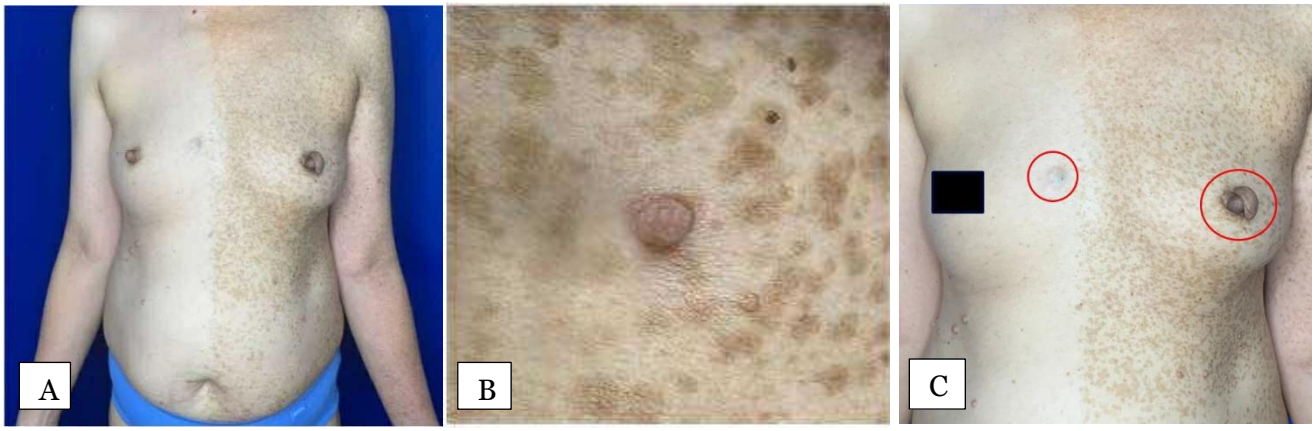

Figure 1. (A) Multiple brown macules and patches on the left side of the trunk, consistent with unilateral lentiginosis; **(B)** Multiple well-defined, soft, skin-colored, non-pruritic, non-tender papules and nodules, several demonstrating the buttonhole sign; **(C)** A well-defined, skin-colored nodule with a central black punctum at the 3 o'clock position of the right breast (~5 cm from the nipple), along with well-defined, soft nodules on the areola of the left breast, partially covering the nipple.

Discussion

NF1, is a tumor-predisposition condition caused by heterozygous germline pathogenic variants in the Neurofibromin 1 tumor suppressor gene (HGNC:7765), located on chromosome 17q11.2, which encodes the protein neurofibromin [2,7]. These variants lead to tumor development, predominantly in neural and epidermal tissues, though NF1 exhibits wide phenotypic variability. Early manifestations may appear as benign epidermal pigmentary changes, which often delay medical consultation.

Establishing the epidemiologic characteristics of NF1 remains challenging due to its phenotypic variability, age-dependent expression, and unpredictable disease course [8]. A diagnosis of NF1 is typically established based on the presence of two or more diagnostic criteria outlined by the National Institutes of Health (NIH) in 1988 [9]. These criteria were revised in 2020 to include additional clinical features and to incorporate genetic testing [10].

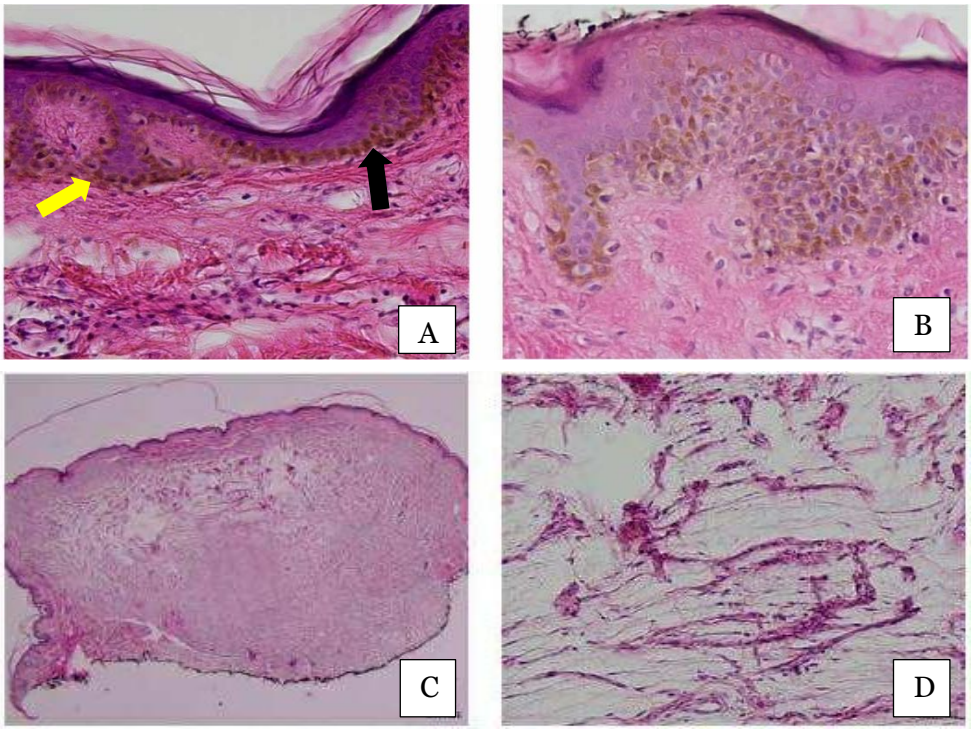

Figure 2. (A) Elongated rete ridges in the epidermis (yellow arrow) and basal layer hyperpigmentation (black arrow) (H&E, 10×); **(B)** Closer view showing basal layer hyperpigmentation (H&E, 40×); **(C)** Non-encapsulated, circumscribed tumor (H&E, 2×); **(D)** Myxoid stroma with spindle-shaped cells (H&E, 10×).

Segmental neurofibromatosis is rare and usually presents with unilateral CALMs, freckling, and/or neurofibromas [11]. Individuals with this variant have a higher risk of developing various malignancies [12], including peripheral nerve sheath tumors, melanoma, and cancers of the breast, colon, stomach, lung, and Hodgkin lymphoma [13,14].

Segmental neurofibromatosis may go undiagnosed as patients often perceive it as a cosmetic issue and are reluctant to seek medical attention. These diagnostic and management challenges are further compounded by the cost of recommended tests and interventions, particularly in patients with limited resources. Such barriers can affect health-seeking behavior, resulting in delayed consultation despite early symptom onset. Consequently, these delays may contribute to the underreporting of NF1 cases and the limited availability of documented data on the condition.

Additionally, the absence of neurofibromas can lead to the condition being overlooked [15]. Feret et al. reported a case of segmental NF1 in a patient presenting with CALMs and right inguinal freckling, without neurofibromas [16]. Similarly, İritaş and İritaş described a 30-year-old woman with segmental neurofibromatosis presenting with CALMs, axillary freckling, and Lisch nodules, but no evidence of neurofibromas. Consequently, segmental neurofibromatosis is likely underreported due to the challenges in achieving an accurate diagnosis [15].

However, in the present case, the patient exhibited neurofibromas, in addition to multiple disseminated CALMs and axillary freckling, thus fulfilling the diagnostic criteria for segmental NF1. The presence of neurofibroma was further confirmed through histopathologic assessment, which revealed an unencapsulated, uniformly symmetrical proliferation of spindle-shaped cells

with wavy nuclei, a characteristic feature of neurofibroma [17].

Various treatment options are available for the management of NF1; however, they primarily address existing manifestations, as tumor development may continue as long as the pathogenic NF1 gene is present. The treatment of cutaneous neurofibromas depends largely on tumor size, with different modalities indicated accordingly: surgery for large tumors (>4 cm), modified biopsy removal for small to medium-sized tumors (up to 2 cm), carbon dioxide (CO_2) ablative laser for small tumors (up to 2 cm), photocoagulation for very small tumors (<1 cm), and electrodessication for very tiny tumors (<5 mm) [18]. Although surgical interventions offer benefits, such as minimal scarring and higher patient satisfaction, resection carries a risk of recurrence and may induce the growth of new neurofibromas [19], making laser-based interventions a preferable option for the patient.

In the present case, the patient was advised to undergo CO_2 ablative laser treatment for the removal of neurofibromas, and QS Nd:YAG laser therapy for lightening the hyperpigmented macules and patches, as the definitive management plan. CO_2 laser ablation provides results comparable to surgical excision for the management of cutaneous neurofibromas [20,21], with the ability to remove multiple lesions in a single procedure [19]. The expected adverse events, including post-operative pain and pruritus, are generally manageable.

While NF1 demonstrates an autosomal dominant pattern of inheritance, the reproductive risk associated with segmental NF1, which involves somatic mosaicism, depends on whether germline cells are affected. This underscores the importance of counseling the patient regarding the genetic and familial implications of NF1. Genetic testing may be performed to identify pathogenic NF1 variants, which can serve as a reference for future prenatal counseling and diagnostic testing [22]. Timely diagnosis and appropriate genetic counseling can enhance patient outcomes [15]. However, genetic testing was not performed, as the patient declined to undergo it.

Conclusion

This case describes a patient with segmental NF1 and partial unilateral lentiginosis, representing an uncommon overlap of these dual presentations. Reporting this rare combination expands the recognized phenotypic spectrum of NF1. While NF1 is typically described in pediatric and young adult populations, this case demonstrates a later onset of neurofibromas, providing insight into the natural history of atypical NF1. The familial occurrence between the patient and her grandmother may reflect either incomplete penetrance, despite NF1 generally showing near-complete penetrance after childhood or familial mosaic inheritance, which could explain the absence of manifestations in the patient's parents; both mechanisms remain underexplored. Additionally, the absence of multisystemic involvement beyond cutaneous lesions raises questions about systemic manifestations in atypical NF1. Future studies reporting atypical NF1 presentations are recommended to further define the phenotypic spectrum and identify features characteristic of other NF1 subtypes.

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Potential Conflict of Interest

The authors declare no conflicts of interest, financial or otherwise, including familial or proprietary considerations.

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