Original Article

Dermoscopic Evaluation of Pigmentary Disorders: A Hospital Based Observational Study

Rashmi Singh[1], Anukriti Singh[1], Prachi Sharma[2]

[1]Associate Professor & HOD, Department of Dermatology, Venereology & Leprosy, MVASMC, Ghazipur, India. [2]Assistant Professor, Department of Dermatology, Venereology & Leprosy, MVASMC, Ghazipur, India

Abstract

Background: With regard to background: pigmentary disorders are one of the most common dermatological diseases and can often cause marked cosmetic and psychological problems, particularly in darker complexion skin people. Dermoscopy has become a handy non-invasive diagnostic tool for examining the subsurface pigment pattern and has enhanced diagnostic accuracy. The objective is to assess dermoscopic characteristics of pigmentary disorders and their clinical relevance in Tertiary care centre patients.Methods: This was a descriptive study that included 100 patients with pigmentary disorders and assessed their dermoscopic features and clinical relevance in the patients attending the tertiary care centre. **Material and Methods:** An observational study was done for 1 year period in a tertiary care hospital, dermatology department. There were 100 patients with clinically diagnosed pigmentary disorders included. Demographic and Clinical data were registered in detail. A dermoscope (handheld polarized camera attached to a smartphone/digital camera) was used for dermoscopic evaluation. The parameters of dermoscopy of pigment network, perifollicular changes, vascular structures and scaling, as well as the type of pigment distribution were evaluated and correlated with the clinical diagnosis. **Results:** Most of the patients were in the age group 31–40 (30%) and predominately females (58%). The most prevalent pigmentary disorders were melasma (32%), vitiligo (24%) and post-inflammatory hyperpigmentation (18%). The most common site was the face (48%). The most common dermoscopic pattern was reticular pigment network (62%), followed by brown globules/dots (44%) and perifollicular pigmentation (38%). In lichen planuspigmentosus, blue-gray granules were characteristically observed and in vitiligo, white structurelessdepigmented areas were mainly observed. The dermatoscopic findings helped to differentiate the clinically similar pigmentary disorders and also helped to minimize diagnostic confusions. **Conclusion:** Dermoscopy is a quick, reliable and non-invasive tool for the diagnosis of pigmentary disorders. It helps with the precise diagnosis by recognizing characteristic dermoscopic patterns and aids in distinguishing between similar diseases so as to avoid invasive procedures and better manage the patient. To read this article, you must be a member of the American Association of Dermatologists. This article is available to members of the AAD only.

Keywords: Dermoscopy, Pigmentary Disorders, Pigmented Skin Lesions, Dermoscopic Patterns, Hyperpigmentation, Hypopigmentation, Skin Pigmentation Disorders.

Received: 02 April 2026 **Revised: 15 May 2026** **Accepted: 27 May 2026** **Published: 01 June 2026**

Introduction

Pigmentary disorders are very common and include a wide range of acquired and congenital diseases of pigment alterations in the skin.[1] These can be caused by defects in melanin production or a decrease in the number of melanocytes, defects in the transfer of the melanosomes, or inflammatory changes in the skin. Melasma, vitiligo, post-inflammatory hyperpigmentation, lichen planuspigmentosus, nevus depigmentosus and idiopathic guttate hypomelanosis,[2] are common pigmentary disorders. While most pigmentary disorders are non-threatening, they often create significant cosmetic issues and psychological distress particularly for those with darker skin phototypes. Correct diagnosis is important, therefore, if proper management and prognosis is to be given.[3] The diagnosis of pigmentary disorders has been made on a clinical basis and first verified by histopathological analysis. Histopathology, however, is an invasive, time-consuming procedure which is not always technically feasible or practical in cosmetically sensitive areas.[4] Recently, dermoscopy has proved to be a useful non-invasive diagnostic technique by helping to visualize subsurface skin structures which are not visible to the naked eye. Dermoscopy is an emerging technique in the diagnosis of pigmented lesions as well as melanoma, but is also increasingly being used in other dermatological diseases, such as inflammatory and pigmentary dermatoses.[5]

Dermoscopy is a tool that enables detailed examination of the pigment pattern, associated vascular structures, perifollicular changes, scales, and other structural features that help to distinguish the various pigmentary diseases. Typical dermoscopic patterns have been described in diseases like

Address for correspondence: Dr. Rashmi Singh, Associate Professor & HOD, Department of Dermatology, Venereology & Leprosy, MVASMC, Ghazipur, India.
E-mail: sweetrashmi4364@gmail.com

DOI:
10.21276/amit.2026.v13.i2.696

How to cite this article: Singh R, Singh A, Sharma P. Dermoscopic Evaluation of Pigmentary Disorders: A Hospital Based Observational Study. Acta Med Int. 2026;13(2):320-324.

Melasma, Vitiligo, lichen planuspigmentosus and post-inflammatory hyperpigmentation, thereby enhancing the diagnostic accuracy and avoiding invasive procedures. Furthermore, dermoscopy can assist in evaluating disease activity, monitoring therapeutic response, and predicting prognosis in certain disorders.[6]

Despite the growing utility of dermoscopy in pigmentary diseases, limited hospital-based observational studies have systematically evaluated the dermoscopic patterns of different pigmentary disorders in the Indian population. Considering the variation in clinical presentation among darker skin types, regional studies are important to establish clinico-dermoscopic correlations and improve diagnostic confidence.[7,8]

Therefore, the present study was undertaken to evaluate the dermoscopic features of various pigmentary disorders in patients attending a tertiary care hospital and to analyze their clinical relevance.

Materials and Methods

Study Design and Setting: This hospital-based observational study was conducted in the Department of Dermatology at a tertiary care Indian hospital over a period of 12 months. The study included patients presenting with various pigmentary disorders attending the dermatology outpatient department.

Study Population: A total of 100 patients clinically diagnosed with pigmentary disorders were enrolled in the study using convenient sampling.

Inclusion Criteria

- Patients of all age groups and both sexes
- Patients clinically diagnosed with pigmentary disorders.
- Patients willing to provide informed consent.

Exclusion Criteria

- Patients with active secondary infection over lesions.
- Patients receiving treatment likely to alter dermoscopic findings within the previous 4 weeks.
- Patients with poorly defined lesions unsuitable for dermoscopic examination.
- Patients unwilling to participate in the study.

Data Collection: Detailed demographic data including age, sex, duration of disease, site of involvement, associated symptoms, and relevant medical history were recorded using a predesigned proforma. A thorough clinical dermatological examination was performed in all cases.

Dermoscopic Examination: Dermoscopic evaluation of lesions was carried out using a handheld polarized dermoscope attached to a Smartphone/digital camera for image capture. Both polarized and non-polarized modes were utilized whenever required. Ultrasound gel/liquid paraffin was used as the interface medium in contact dermoscopy.

Dermoscopic parameters assessed included:

- Pigment network pattern
- Distribution and color of pigmentation
- Perifollicular changes
- Scaling and surface changes
- Vascular structures
- Dots, globules, blotches, and other specific dermoscopic clues

The observed dermoscopic findings were documented and correlated with the clinical diagnosis.

Statistical Analysis: Data were analyzed using Statistical Package for Social Sciences (SPSS) version 26. Categorical variables were expressed as frequencies and percentages, while continuous variables were expressed as mean ± standard deviation. Appropriate statistical tests such as Chi-square test and Student's t-test were applied wherever necessary. A p-value of <0.05 was considered statistically significant.

Results

Among the 100 patients included in the study, the majority belonged to the 31–40 years age group (30%), with a female predominance (58%). The mean age of participants was 34.8 ± 11.6 years [Table 1]. Melasma was the most common pigmentary disorder observed (32%), followed by vitiligo (24%) and post-inflammatory hyperpigmentation (18%) [Table 2].

The face was the most commonly affected site (48%), details description shown in [Graph 1]. Dermoscopic examination revealed reticular pigment network as the predominant finding (62%), followed by brown globules/dots (44%) and perifollicular pigmentation (38%) [Graph 2]. Blue-gray granules were characteristically observed in lichen planuspigmentosus, whereas white structurelessdepigmented areas were predominantly noted in vitiligo cases [Table 3].

Most patients had disease duration between 6 months and 1 year (34%). Dermoscopy significantly aided in differentiating pigmentary disorders by demonstrating characteristic pigment patterns and perifollicular changes [Table 4].

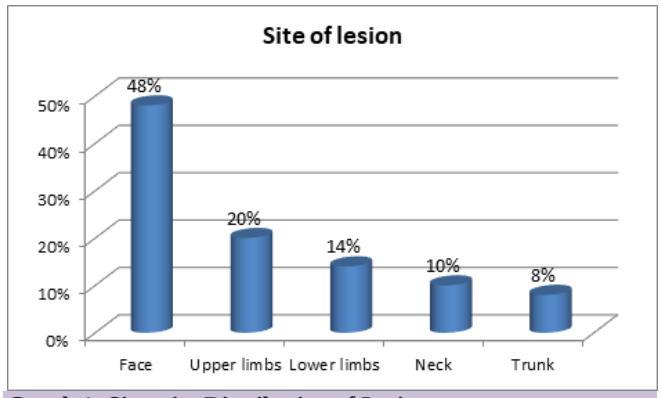
Table 1: Demographic Characteristics of Study Participants (n=100)

Variable		Frequency (%)
Age Group (Years)	<20	12 (12%)
	21–30	28 (28%)
	31–40	30 (30%)
	41–50	18 (18%)
	>50	12 (12%)
Mean Age ± SD		34.8 ± 11.6 years
Gender	Male	42 (42%)
	Female	58 (58%)

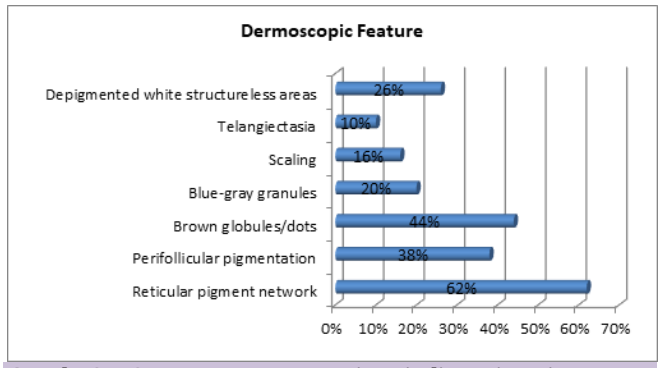
Table 2: Distribution of Pigmentary Disorders Observed

Pigmentary Disorder	Number (%)
Melasma	32 (32%)
Vitiligo	24 (24%)
Post-inflammatory Hyperpigmentation	18 (18%)

Lichen PlanusPigmentosus	12 (12%)
Idiopathic GuttateHypomelanosis	8 (8%)
Nevus Depigmentosus	6 (6%)



Graph 1: Site-wise Distribution of Lesions



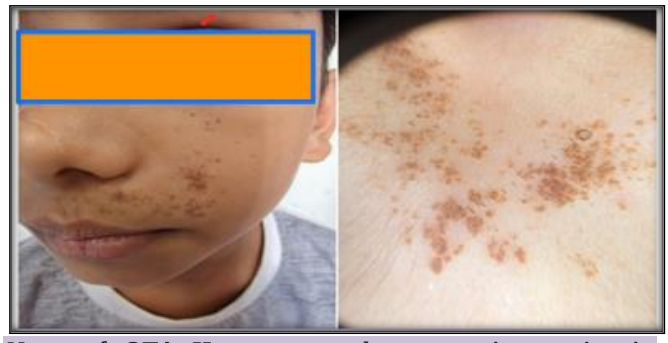
Graph 2: Common Dermoscopic Findings in Pigmentary Disorders.

Table 3: Dermoscopic Findings According to Diagnosis

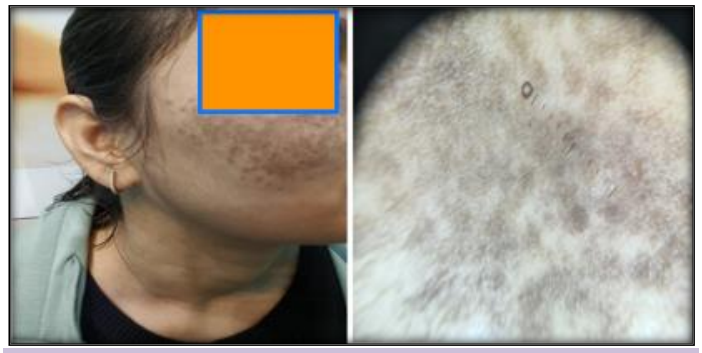
Dermoscopic Feature	Melasma	Vitiligo	PIH	LPP
Reticular pigmentation	28	2	14	8
Perifollicular accentuation	18	0	6	7
Brown dots/globules	20	0	12	5
Blue-gray granules	2	0	3	10
White structureless areas	0	24	0	0

Table 4: Duration of Disease Among Participants

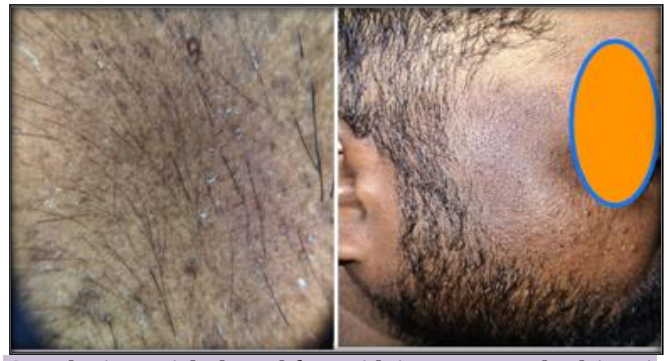
Duration	Frequency (%)
<6 months	22 (22%)
6 months – 1 year	34 (34%)
1–3 years	28 (28%)
>3 years	16 (16%)



Nevus of OTA Homogeneous slate grey pigmentation in dermoscopy



Nevus of OTA Homogeneous slate grey pigmentation in dermoscopy



Acanthosis on right lateral face with interconnected sulci gyri pattern

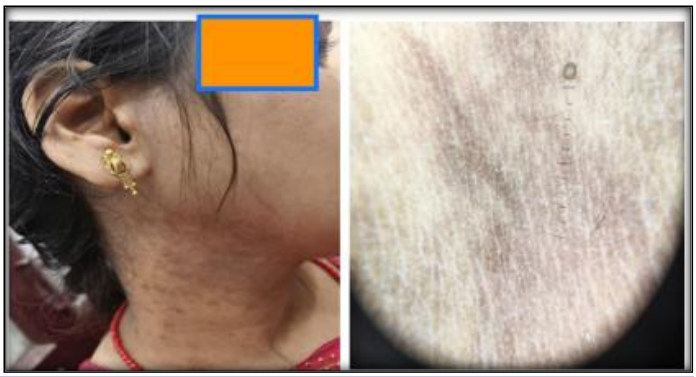
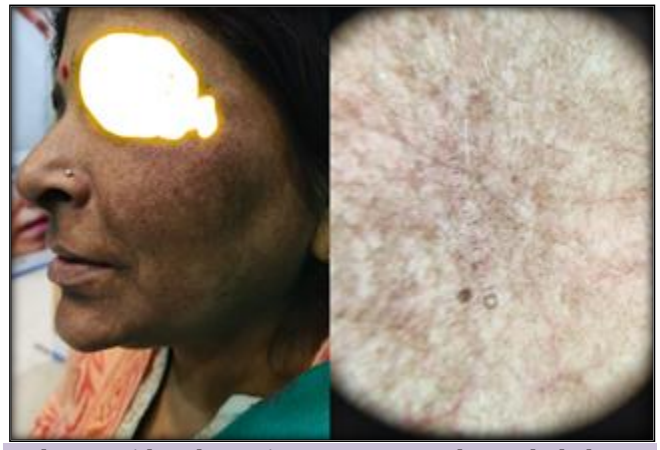


Figure LPP: Background light to dark brown pigmentation with globules and hem like pattern.



Melasma with ochronosis: Dermoscopy shows dark brown globules, curvilinear worm like structures

Discussion

Pigmentary disorders are a significant sub-group of dermatological conditions and are commonly linked to disfigurement of the cosmetics including psychosocial distress in some individuals with darker skin phototypes. Dermoscopy has become a useful non-invasive diagnostic tool and helps to better visualize the subsurface pigmentary alterations and better to reach a diagnosis in these situations. In the present observational study which was conducted at a hospital, a melanoderma spot (Melasma) was seen to be the most common pigmentary disorder seen followed by vitiligo and post-inflammatory hyperpigmentation (PIH). Arora P et al and Bhari N et al found Melasma to be one of the common pigmentary disorders in darker skin types in the outpatient dermatology settings.[9,10]

Most of the patients of the current study were aged 31-40 years, female dominated. This finding supports previous research showing that hormonal changes, cosmetic use and sun exposure over time are the likely explanations for the increased prevalence of pigmentary disorders, particularly melasma in women of reproductive age.[11,12] The face constituted the most frequently affected area in our study and this is consistent with the fact that melasma and other acquired facial melanoses are known to be more prevalent on sun-exposed areas of the face. In previous dermoscopic investigations, distribution patterns can be seen in the same distributions as in pigmentary disorders.

The most frequent dermoscopic finding seen in the present study was reticular pigment network. Increased melanin deposition and basal layer pigmentation was the main feature observed in melasma and PIH patients. Vinay et al,[5] reported similar observations, stating that the dermoscopic findings of excessive pseudoreticular and reticular pigmentation are characteristic of the acquired macular hyper pigmentation disorders. The brown globules and the brown dots were also commonly observed, especially in melasma and PIH, which was interpreted as melanin deposit in the epidermis and dermis. These observations corroborate previous observations by Elmas, et al,[13] who highlighted the importance of dermoscopic differentiation of epidermal versus dermal patterns of pigmentation.

Lichen planuspigmentosus (LPP) was mostly seen in the form of bluish granules in the present study. This dermoscopic feature histopathologically corresponds to dermal melanophages or pigment incontinence. Previous studies on the dermoscopy of LPP and acquired dermal macularhyperpigmentation have reported comparable results.[6,14] The presence of diffuse blue-gray granules and perifollicular pigmentation was felt to be very indicative of LPP in darker skin types.

The dermoscopic features of cases in the study were typical of cases of vitiligo, presenting with white depigmentation without structure. Absence of pigment network and sharply outlined depigmented areas helped to distinguish vitiligo from the other hypopigmentary conditions. The observations are consistent with the findings of Poon E et al,[17] and Kumar J et al,[18] who noted dermoscopy as a valuable adjunctive technique to help determine the margins and disease activity in vitiligo.

Additionally, normal accentuation in the perifollicular area was seen in many pigmentary disorders including Melasma and LPP. Dermoscopy was useful in diagnosis of small perifollicular pigmentation not appreciated clinically thus improving the diagnostic confidence. Dermoscopy has the power to distinguish the characteristic distribution of the pigments and this has reduced the diagnostic ambiguity to a large extent and may help in avoiding unnecessary invasive procedures like skin biopsy in cosmetically sensitive areas.

Conclusion

In the evaluation of pigmentary disorders, dermoscopy is a useful non-invasive diagnostic technique that helps to increase the diagnostic accuracy by showing specific pigment patterns and subsurface structural changes. Melasma was the most frequent pigmentary disorder in the present study, whereas reticular pigmentation, brown globules/dots, perifollicular accentuation, blue-gray granules and white structureless areas were the most frequent dermoscopic findings of various conditions. Dermoscopy was found to be helpful in differentiating clinically similar conditions like Melasma, post-inflammatory hyperpigmentation, lichen planuspigmentosus and vitiligo. Likewise, the technique decreased the requirement for invading diagnostic techniques and even offered valuable insights into the activity of the disease and how deeply the pigment had penetrated. Therefore, dermoscopy is a simple, quick and an affordable tool which can be used as a routine investigative and management tool in clinical dermatology practice for pigmentary disorders.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Gupta D, Thappa DM. Dermoscopy of pigmentary disorders. Indian J DermatolVenereolLeprol. 2013;79(3):380-91.
2. Errichetti E, Stinco G. Dermoscopy in general dermatology: a practical overview. DermatolTher (Heidelb). 2016;6(4):471-507.
3. Nischal KC, Khopkar U. Dermoscope. Indian J

DermatolVenereolLeprol. 2005;71(4):300-3.
4. Kittler H, Marghoob AA, Argenziano G, Carrera C, Curiel-Lewandrowski C, Hofmann-Wellenhof R, et al. Standardization of terminology in dermoscopy/dermatoscopy. J Am AcadDermatol. 2016; 74(6):1093-106.
5. Vinay K, Bishnoi A, Parsad D, Saikia UN, SendhilKumaran M. Dermoscopy of acquired dermal macular hyperpigmentation. Indian Dermatol Online J. 2017;8(6):479-86.
6. Bhat YJ, Hassan I, Keen A, Latif I, Bashir S. Dermoscopy of pigmentary disorders in brown skin. Indian Dermatol Online J. 2019;10(6):682-90.
7. Benzekri L, Mernissi FZ. Dermoscopy of common pigmentary disorders. DermatolPract Concept. 2021;11(2):e2021045.
8. Lallas A, Errichetti E, Apalla Z, Di Stefani A, Stinco G. Dermoscopy in medical dermatology: current applications and future perspectives. DermatolPract Concept. 2017;7(2):1-8.
9. Bhari N, Mahajan R, Singh SK, Kumar U, Ghiya BC. Dermoscopy of facial melanoses in Indian patients. Pigment Int. 2016;3(1):7-12.
10. Arora P, Sardana K, Mathachan SR, Garg VK. Dermoscopic evaluation of acquired pigmentary disorders in skin of color. J CosmetDermatol. 2020;19(9):2345-52.
11. Rathod DG, Mendiratta V, Agarwal S, Chander R. Dermoscopic findings in melasma and their correlation with Wood's lamp examination. Indian Dermatol Online J. 2019; 10(4):412-7.
12. Sharma VK, Gupta V, Sharma RC, Mahajan VK. Dermoscopy in vitiligo and other hypopigmentary disorders. DermatolPract Concept. 2018;8(3):183-9.
13. Elmas OF, Demirbaş A, Kutlu Ö. Dermoscopic features of lichen planuspigmentosus and differential diagnosis. Australas J Dermatol. 2020;61(4):e437-42.
14. Tiodorovic-Zivkovic D, Argenziano G, Lallas A, et al. Dermoscopy of pigmentary skin disorders. G ItalDermatolVenereol. 2015;150(6):673-82.
15. Poon E, Nixon R. Dermoscopy in ethnic skin and pigmentary disorders. ClinDermatol. 2018;36(4):473-81.
16. Kumar J, Kumaran MS, Vinay K, Parsad D. Dermoscopy of post-inflammatory hyperpigmentation: a cross-sectional observational study. Int J Dermatol. 2021;60(8):1012-8.