



CLINICAL, DERMOSCOPIC AND HISTOPATHOLOGICAL CORRELATION OF PIGMENTED FACIAL LESIONS: A PROSPECTIVE OBSERVATIONAL STUDY

Dr Pooja Varshney^{1*}, Dr Navneet Dev

^{1*}Assistant Professor, Krishna Mohan Medical College, Mathura, MD, Department of Dermatology Venereology & Leprosy

²Associate Professor, Department of Dermatology, Graphic Era Medical College, Graphic Era Deemed University, Dehradun, Uttarakhand, India

Corresponding Author Mail Id - drpoojav0130@gmail.com

***Corresponding Author:** Dr Pooja Varshney

*Assistant Professor, Krishna Mohan Medical College, Mathura, MD, Department of Dermatology Venereology & Leprosy. Mail Id - drpoojav0130@gmail.com

ABSTRACT

Background: Pigmented facial lesions comprise a heterogeneous group of disorders ranging from benign melanocytic and epidermal lesions to premalignant and malignant conditions. Clinical examination alone may not always reliably differentiate these lesions. Dermoscopy provides additional morphological information and may improve diagnostic accuracy, while histopathology remains the definitive diagnostic method. The present study was undertaken to evaluate the clinical, dermoscopic and histopathological features of pigmented facial lesions and determine their correlation.

Materials and Methods: This prospective observational study included 85 patients with pigmented facial lesions. Detailed clinical examination was performed with documentation of age, sex, duration, anatomical site, morphology, colour and clinical diagnosis. Dermoscopic examination was subsequently performed to identify pigment networks, pseudonetworks, dots and globules, structureless areas, blue-grey structures, regression features and vascular patterns. Histopathological examination was performed according to the study protocol, and clinical and dermoscopic findings were correlated with the final histopathological diagnosis. Diagnostic performance of dermoscopy was assessed using sensitivity, specificity, positive predictive value, negative predictive value and overall diagnostic accuracy.

Results: Among the 85 patients, 53 (62.4%) were females and 32 (37.6%) were males. The most frequent age group was 41–50 years (20; 23.5%). The cheek was the commonest anatomical site (27; 31.8%), while macular lesions constituted the predominant morphology (37; 43.5%). Dark-brown pigmentation was the most frequent colour pattern (25; 29.4%). Melasma was the commonest clinical diagnosis (18; 21.2%). On dermoscopy, homogeneous pigmentation (31; 36.5%), structureless brown areas (28; 32.9%) and pseudonetwork (24; 28.2%) were frequently observed.

Histopathological examination demonstrated 29 (34.1%) positive/significant lesions, while 56 (65.9%) were benign/negative. Among the positive lesions, pigmented actinic keratosis accounted for 7 (24.1%), pigmented basal cell carcinoma for 6 (20.7%), atypical melanocytic nevus for 5 (17.2%) and melanoma for 4 (13.8%). Dermoscopy correctly identified 25 of the 29 positive lesions. Its sensitivity was 86.2%, specificity 82.1%, positive predictive value 71.4%, negative predictive value 92.0%, and overall diagnostic accuracy 83.5%.

Conclusion: Pigmented facial lesions demonstrate considerable clinical and dermoscopic variability. Dermoscopy provides valuable additional diagnostic information and showed good agreement with histopathological findings in this study. However, histopathological examination remains essential for definitive diagnosis, particularly in lesions showing suspicious clinical or dermoscopic features.

Keywords: Pigmented facial lesions; Dermoscopy; Histopathology; Melanoma; Pigmented basal cell carcinoma; Dermoscopic patterns; Clinicopathological correlation.

INTRODUCTION

Pigmented facial lesions constitute a heterogeneous group of melanocytic and non-melanocytic disorders that range from common benign conditions to premalignant lesions and cutaneous malignancies. Facial pigmentation is particularly important because the face is chronically exposed to ultraviolet radiation and contains numerous cosmetically and functionally important anatomical structures. Clinically, lesions may present as macules, papules, plaques or nodules with variable shades of brown, black, grey or blue, and considerable overlap may occur between benign and malignant lesions. Consequently, clinical examination alone may sometimes be insufficient for accurate diagnosis.

Dermoscopy, also referred to as dermatoscopy, is a non-invasive in-vivo technique that permits visualization of subsurface structures that are not readily apparent on naked-eye examination. It provides an important link between clinical morphology and histopathological architecture and has become an established component of the evaluation of pigmented lesions.^{1,2} Dermoscopic examination allows assessment of lesion architecture, pigment distribution, vascular structures, symmetry, borders and specific structures such as dots, globules, streaks, pigment networks and structureless areas.³

The importance of dermoscopy is particularly evident in the evaluation of melanoma and other atypical pigmented lesions. Studies have demonstrated that dermoscopy can improve diagnostic accuracy compared with unaided clinical examination, particularly when performed by appropriately trained clinicians.^{4,5} Various diagnostic approaches, including pattern analysis, the ABCD rule, the seven-point checklist and the Menzies method, have been developed to systematically assess pigmented lesions.⁶ These approaches emphasize assessment of global architecture together with specific local dermoscopic structures rather than relying on a single feature.

Facial pigmented lesions present additional diagnostic challenges because the dermoscopic patterns of facial skin differ from those seen on non-facial sites. The presence of numerous follicular openings produces characteristic pseudonetwork patterns, while chronic ultraviolet exposure may produce heterogeneous pigmentation and multiple overlapping dermoscopic features.⁷ Solar lentigo, seborrhoeic keratosis, pigmented actinic keratosis and lentigo maligna may clinically resemble one another, making their differentiation particularly important. Dermoscopic assessment of these lesions can reveal characteristic combinations of pigmentary, follicular, epidermal and vascular patterns.⁸

Melanocytic nevi may show relatively organized dermoscopic patterns, whereas melanoma is more often associated with architectural disorder, multiple colours and melanoma-specific structures.⁹ However, no single dermoscopic feature is sufficiently specific to establish malignancy in every case. Dermoscopic interpretation therefore requires assessment of the overall lesion architecture and correlation with the clinical setting.¹⁰ Standardization of dermoscopic terminology and diagnostic

algorithms has further improved communication and reproducibility between clinicians.¹¹

Pigmented basal cell carcinoma represents another important diagnostic consideration on the face. Clinically, it may resemble a melanocytic lesion or other pigmented tumour. Dermoscopy can demonstrate features such as multiple blue-grey globules and ovoid nests, leaf-like areas, spoke-wheel structures and other characteristic findings, thereby assisting in clinical differentiation.¹² Similarly, pigmented actinic keratosis may mimic lentigo maligna or other pigmented macules, and dermoscopy can provide useful clues regarding its epidermal and follicular pattern.⁸

The relationship between dermoscopic findings and histopathological structures is important for understanding the diagnostic value of dermoscopy. Dermoscopic structures represent optical manifestations of underlying histological alterations, including melanin distribution, melanocytic proliferation, epidermal hyperpigmentation, inflammation and vascular changes.¹³ Histopathology, however, remains the reference standard for definitive diagnosis when a lesion is clinically or dermoscopically suspicious. Correlating dermoscopic findings with histopathological features can therefore improve understanding of the diagnostic significance of individual dermoscopic patterns.

Recent advances have expanded the role of dermoscopy beyond melanoma detection to the evaluation of a broad spectrum of benign, premalignant and malignant pigmented lesions. Current reviews emphasize the continuing development of diagnostic algorithms and recognition of additional dermoscopic clues for melanocytic nevi, melanoma and pigmented basal cell carcinoma.¹⁴

Despite these advances, distinguishing benign from clinically significant pigmented facial lesions can remain challenging, particularly when lesions display overlapping clinical and dermoscopic characteristics. Therefore, a systematic clinical, dermoscopic and histopathological correlation is valuable. Such correlation can help identify dermoscopic patterns associated with specific histopathological diagnoses and determine the diagnostic performance of dermoscopy in routine clinical practice.

The present study was therefore undertaken to evaluate the clinical, dermoscopic and histopathological characteristics of pigmented facial lesions and to determine the degree of correlation between clinical examination, dermoscopic findings and histopathological diagnosis.

MATERIALS AND METHODS

Study Design And Setting

The present study was designed as a prospective observational study conducted in the Department of Dermatology at a tertiary-care hospital. The study included patients presenting with clinically apparent pigmented lesions involving the face.

Study population

A total of 85 patients with pigmented facial lesions were included in the study. Patients were recruited after clinical evaluation and fulfillment of the predefined eligibility criteria.

Study duration

The study was conducted over the predefined study period after obtaining institutional approval and informed consent from the participants.

Inclusion criteria

Patients fulfilling the following criteria were included:

1. Patients presenting with one or more clinically identifiable pigmented lesions over the face.
2. Patients willing to undergo dermoscopic examination.
3. Patients willing to undergo biopsy/excision and histopathological examination when indicated.
4. Patients providing written informed consent.

Exclusion criteria

Patients were excluded if they:

1. Refused dermoscopic examination or biopsy when indicated.
2. Had an active local infection or significant inflammation obscuring the lesion.
3. Had inadequate clinical or dermoscopic documentation.

4. Had previously treated lesions in which treatment significantly altered the clinical or dermoscopic appearance.
5. Were unwilling to participate in the study.

Clinical examination

A detailed history was obtained regarding age, sex, duration of the lesion, progression, symptoms, previous treatment and relevant exposure history. Dermatological examination documented the anatomical location, number, size, morphology, colour, surface characteristics and clinical diagnosis of each lesion.

Dermoscopic examination

Dermoscopic examination was performed using a dermoscope under appropriate illumination. Both global and local dermoscopic features were assessed. The following parameters were documented:

- Pigment network/pseudonetwork
- Homogeneous pigmentation
- Structureless brown areas
- Dots and globules
- Streaks
- Multiple pigmentation
- Blue-grey structures
- Regression-like structures
- Vascular structures
- Asymmetry and border irregularity

The dermoscopic impression was categorized as non-suspicious or suspicious according to the overall dermoscopic architecture and predefined diagnostic criteria.

Histopathological examination

Lesions selected according to the study protocol were subjected to biopsy or excision. Specimens were fixed, processed and stained with routine hematoxylin and eosin staining. Histopathological assessment included evaluation of epidermal changes, melanocytic proliferation, melanization, architectural atypia, cellular atypia, inflammatory changes and features of malignancy. The final histopathological diagnosis was considered the reference diagnosis.

Clinical–dermoscopic–histopathological correlation

The clinical diagnosis and dermoscopic impression were compared with the final histopathological diagnosis. Lesions were categorized according to whether the clinical and dermoscopic findings showed complete concordance, partial concordance or discordance with histopathology.

Statistical analysis

Data were entered into a computerized database and analyzed using appropriate statistical methods. Categorical variables were expressed as frequency and percentage, while continuous variables were summarized using appropriate measures of central tendency and dispersion. Diagnostic performance of dermoscopy was assessed using sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy. A p-value of <0.05 was considered statistically significant where applicable.

RESULTS

A total of 85 patients with clinically diagnosed pigmented facial lesions were included in the study. All patients underwent clinical assessment and dermoscopic examination, while lesions selected according to the study protocol underwent histopathological evaluation. Histopathology identified 29 (34.1%) positive/significant lesions, while 56 (65.9%) were benign/negative.

Table 1. Age-wise distribution of study participants (n=85)

Age group (years)	Number	Percentage
≤20	6	7.1
21–30	14	16.5
31–40	18	21.2
41–50	20	23.5
51–60	16	18.8
>60	11	12.9
Total	85	100.0

The majority of participants belonged to the 41–50-year age group (20; 23.5%), followed by those aged 31–40 years (18; 21.2%) and 51–60 years (16; 18.8%). Patients aged ≤20 years constituted 6 (7.1%) cases, whereas 11 (12.9%) participants were above 60 years. Thus, pigmented facial lesions were predominantly observed among middle-aged and older adults.

Table 2. Sex distribution of study participants

Sex	Number	Percentage
Male	32	37.6
Female	53	62.4
Total	85	100.0

Females constituted the majority of the study population, accounting for 53 (62.4%) cases, whereas males constituted 32 (37.6%) cases. The female predominance may partly reflect the frequent presentation of cosmetically noticeable facial pigmentation.

Table 3. Duration of pigmented facial lesion

Duration	Number	Percentage
<6 months	14	16.5
6 months–1 year	17	20.0
1–3 years	24	28.2
3–5 years	16	18.8
>5 years	14	16.5
Total	85	100.0

The most common duration was 1–3 years, observed in 24 (28.2%) patients. Seventeen (20.0%) patients had lesions for 6 months to 1 year, while 14 (16.5%) each had lesions for less than 6 months and more than 5 years. This indicates that a substantial proportion of lesions had a relatively prolonged clinical course.

Table 4. Distribution according to anatomical site

Site	Number	Percentage
Cheek	27	31.8
Forehead	14	16.5
Nose	10	11.8
Perioral region	9	10.6

Site	Number	Percentage
Chin	8	9.4
Periocular region	7	8.2
Multiple facial sites	10	11.8
Total	85	100.0

The cheek was the most frequently affected site, accounting for 27 (31.8%) cases. The forehead was involved in 14 (16.5%), while the nose and multiple facial sites accounted for 10 (11.8%) cases each. Perioral, chin and periocular lesions constituted 9 (10.6%), 8 (9.4%) and 7 (8.2%) cases, respectively.

Table 5. Clinical morphology of lesion.

Clinical morphology	Number	Percentage
Macular	37	43.5
Papular	16	18.8
Plaque	14	16.5
Nodular	9	10.6
Mixed maculopapular	9	10.6
Total	85	100.0

Macular lesions were the predominant clinical morphology, seen in 37 (43.5%) patients. Papules were observed in 16 (18.8%), plaques in 14 (16.5%), and nodular and mixed maculopapular lesions in 9 (10.6%) cases each.

Table 6. Clinical colour of lesions

Colour	Number	Percentage
Light brown	22	25.9
Dark brown	25	29.4
Black	11	12.9
Bluish/blue-black	7	8.2
Brown-black	15	17.6
Mixed pigmentation	5	5.9
Total	85	100.0

Dark brown pigmentation was most common, occurring in 25 (29.4%) cases, followed by light brown pigmentation in 22 (25.9%). Brown-black pigmentation was observed in 15 (17.6%), whereas black lesions accounted for 11 (12.9%). Bluish/blue-black pigmentation was present in 7 (8.2%) cases.

Table 7. Clinical diagnosis of pigmented facial lesions

Clinical diagnosis	Number	Percentage
Melasma	18	21.2
Melanocytic nevus	14	16.5
Seborrhoeic keratosis	12	14.1
Lentigo	10	11.8

Clinical diagnosis	Number	Percentage
Post-inflammatory hyperpigmentation	9	10.6
Pigmented actinic keratosis	7	8.2
Pigmented basal cell carcinoma	5	5.9
Melanoma suspected clinically	4	4.7
Other lesions	6	7.1
Total	85	100.0

Melasma was the commonest clinical diagnosis, accounting for 18 (21.2%) cases, followed by melanocytic nevus (14; 16.5%) and seborrhoeic keratosis (12; 14.1%). Pigmented actinic keratosis, pigmented basal cell carcinoma and clinically suspected melanoma together represented lesions requiring particular attention because of their potential histopathological significance.

Table 8. Major dermoscopic patterns observed

Dermoscopic feature	Number	Percentage
Homogeneous pigmentation	31	36.5
Pseudonetwork	24	28.2
Regular pigment network	18	21.2
Irregular pigment network	14	16.5
Dots/globules	20	23.5
Structureless brown areas	28	32.9
Multiple brown shades	19	22.4
Blue-grey areas	9	10.6
Regression-like structures	6	7.1
Atypical vessels	5	5.9

Homogeneous pigmentation was the most frequently observed dermoscopic finding, occurring in 31 (36.5%) lesions. Structureless brown areas were present in 28 (32.9%), while pseudonetwork was identified in 24 (28.2%). Irregular pigment network, blue-grey areas, regression-like structures and atypical vessels were less frequent but were particularly relevant in lesions considered suspicious on dermoscopic examination.

Table 9. Histopathological diagnosis (n=85)

Histopathological diagnosis	Number	Percentage
Melasma	16	18.8
Melanocytic nevus	12	14.1
Seborrhoeic keratosis	10	11.8
Lentigo	8	9.4
Post-inflammatory hyperpigmentation	10	11.8
Pigmented actinic keratosis	7	8.2
Pigmented basal cell carcinoma	6	7.1
Melanoma	4	4.7
Other benign lesions	12	14.1

Histopathological diagnosis	Number	Percentage
Total	85	100.0

Histopathological examination demonstrated that most lesions were benign. Melasma was the most frequent histopathological diagnosis (16; 18.8%), followed by melanocytic nevus (12; 14.1%). Pigmented actinic keratosis was identified in 7 (8.2%) cases, pigmented basal cell carcinoma in 6 (7.1%), and melanoma in 4 (4.7%).

Table 10. Distribution according to histopathological positivity

Histopathological status	Number	Percentage
Positive/significant lesion	29	34.1
Negative/benign lesion	56	65.9
Total	85	100.0

Of the 85 lesions evaluated, 29 (34.1%) were classified as positive/significant lesions, whereas 56 (65.9%) were negative/benign. The positive group included lesions with clinically or histopathologically significant pathology according to the predefined study criteria.

Table 11. Histopathological composition of positive cases (n=29)

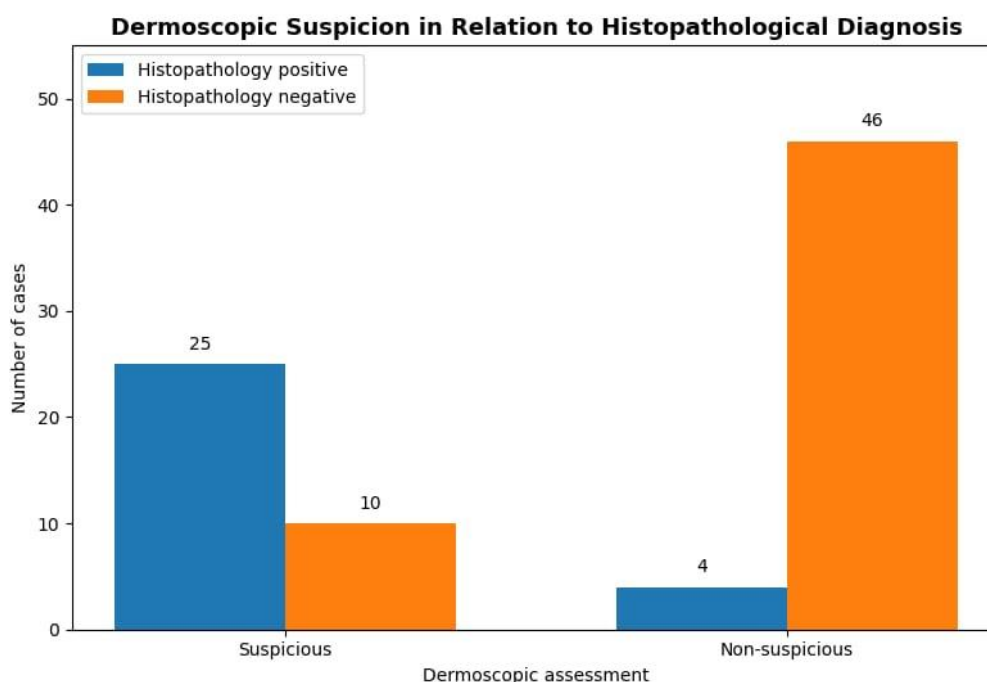
Positive histopathological diagnosis	Number	Percentage of positive cases
Pigmented actinic keratosis	7	24.1
Pigmented basal cell carcinoma	6	20.7
Melanoma	4	13.8
Atypical melanocytic nevus	5	17.2
Other significant pigmented lesions	7	24.1
Total	29	100.0

Among the 29 positive/significant cases, pigmented actinic keratosis and other significant pigmented lesions each accounted for 7 (24.1%) cases. Pigmented basal cell carcinoma was diagnosed in 6 (20.7%), atypical melanocytic nevus in 5 (17.2%), and melanoma in 4 (13.8%). Thus, a clinically important proportion of lesions demonstrated significant pathology on histopathological assessment.

Table 12. Dermoscopic suspicion in relation to histopathological diagnosis

Dermoscopic assessment	Histopathology positive	Histopathology negative	Total
Suspicious	25	10	35
Non-suspicious	4	46	50
Total	29	56	85

Among the 29 histopathologically positive lesions, 25 (86.2%) were identified as suspicious on dermoscopy, while 4 (13.8%) did not demonstrate sufficiently suspicious dermoscopic features. Among the 56 histopathologically negative lesions, 46 were considered non-suspicious and 10 were categorized as suspicious. This demonstrates substantial correspondence between dermoscopic assessment and histopathological findings.



Graph 1: Dermoscopic suspicion in relation to histopathological diagnosis

Table 13. Diagnostic performance of dermoscopy

Parameter	Value
True positive	25
False positive	10
True negative	46
False negative	4
Sensitivity	86.2%
Specificity	82.1%
Positive predictive value	71.4%
Negative predictive value	92.0%
Diagnostic accuracy	83.5%

Dermoscopy demonstrated a sensitivity of 86.2% and specificity of 82.1% for identifying histopathologically significant lesions in this dataset. The negative predictive value was 92.0%, indicating that most lesions considered non-suspicious dermoscopically were benign on histopathology. Overall diagnostic accuracy was 83.5%.

Table 14. Clinical–dermoscopic–histopathological correlation

Correlation	Number	Percentage
Complete concordance	61	71.8
Partial concordance	15	17.6
Discordance	9	10.6
Total	85	100.0

Complete clinical, dermoscopic and histopathological concordance was observed in 61 (71.8%) cases. Partial concordance was present in 15 (17.6%) cases, while 9 (10.6%) showed discordance between the clinical and dermoscopic impression and the final histopathological diagnosis. These

findings demonstrate the additional diagnostic information provided by dermoscopy when clinical morphology alone is insufficient.

Discussion

Pigmented facial lesions represent a diagnostically challenging group of cutaneous disorders because benign, premalignant and malignant lesions may show considerable clinical and dermoscopic overlap. The present study evaluated 85 patients with pigmented facial lesions using clinical examination, dermoscopy and histopathology, with the objective of determining the correlation between these three diagnostic approaches. Histopathology identified 29 (34.1%) positive/significant lesions, whereas 56 (65.9%) were benign/negative.

In the present study, females constituted the majority of the study population, with 53 (62.4%) females and 32 (37.6%) males. The predominance of females may partly be related to the greater cosmetic concern associated with facial pigmentation and the higher likelihood of women seeking dermatological consultation for facial lesions. The age distribution demonstrated a predominance of middle-aged patients, with the 41–50-year group accounting for 20 (23.5%) cases. This finding is clinically relevant because cumulative ultraviolet exposure and age-related changes in melanocytic and epidermal structures contribute to the development of several facial pigmented lesions.

The cheek was the most frequently affected anatomical site in the present study, accounting for 27 (31.8%) cases, followed by the forehead and nose. Facial skin has a distinctive anatomical and histological structure, particularly because of the presence of numerous hair follicles. Consequently, pigmentation around follicular openings produces characteristic dermoscopic patterns that differ from those encountered at other anatomical sites. Lallas et al. emphasized that facial pigmented macules remain diagnostically challenging because solar lentigo, pigmented actinic keratosis, seborrhoeic keratosis and lentigo maligna can have overlapping clinical and dermoscopic characteristics.¹⁴

Macular lesions were the predominant morphology in our study, accounting for 37 (43.5%) cases. Brown pigmentation was the most common colour pattern. These findings are consistent with the broad clinical spectrum of facial pigmented lesions, many of which initially present as flat brown macules. Clinical morphology alone, however, may not reliably differentiate benign lesions from early malignant or premalignant lesions. This emphasizes the importance of incorporating dermoscopic evaluation into the assessment of suspicious facial pigmentation.

Melasma was the commonest clinical diagnosis in our study, comprising 18 (21.2%) cases, followed by melanocytic nevus and seborrhoeic keratosis. Histopathological assessment similarly demonstrated melasma as the most frequent individual diagnosis. The relatively high frequency of melasma reflects the common occurrence of facial hyperpigmentation in dermatological practice. Nevertheless, the study also demonstrated that apparently benign clinical lesions may occasionally show significant histopathological abnormalities, supporting the role of careful assessment of atypical lesions.

On dermoscopy, homogeneous pigmentation was the most frequent finding, observed in 31 (36.5%) lesions, followed by structureless brown areas in 28 (32.9%) and pseudonetwork in 24 (28.2%). The facial pseudonetwork is an important dermoscopic pattern resulting from pigmentation surrounding relatively spared follicular openings. Dermoscopic studies of facial pigmented lesions have demonstrated that follicular and epidermal patterns can provide important clues for differentiating seborrhoeic keratosis, solar lentigo, pigmented actinic keratosis and lentigo maligna.⁸

Irregular pigment network, multiple shades of pigmentation, blue-grey structures and regression-like features were less frequent but were important in suspicious lesions. Dermoscopy is valuable because it enables visualization of subsurface pigment distribution and architectural characteristics that cannot be appreciated adequately by naked-eye examination. The correlation between dermoscopic structures and their histopathological counterparts has been demonstrated in previous clinicopathological studies.¹³

In our study, 29 (34.1%) lesions were categorized as positive/significant on histopathological examination. Pigmented actinic keratosis accounted for 7 (24.1%) of these cases, pigmented basal

cell carcinoma for 6 (20.7%), atypical melanocytic nevus for 5 (17.2%) and melanoma for 4 (13.8%). The occurrence of these lesions highlights the importance of careful evaluation of facial pigmentation, particularly in older individuals and lesions showing asymmetry, multiple colours, irregular structures or other suspicious dermoscopic features.

The differentiation between pigmented actinic keratosis and lentigo maligna is particularly difficult. Akay et al. studied flat pigmented facial lesions and demonstrated considerable dermoscopic overlap between pigmented actinic keratosis and lentigo maligna. Their findings included slate-grey dots, annular-granular patterns, rhomboidal structures and pseudonetworks among pigmented actinic keratoses, demonstrating why dermoscopic diagnosis should not depend on a single feature.¹⁵

Similarly, dermoscopic criteria such as asymmetrical pigmented follicular openings, rhomboidal structures, annular-granular structures and grey pseudonetwork have been described in facial lentigo maligna. However, some of these findings may also occur in benign or premalignant facial lesions, limiting their specificity when interpreted in isolation.¹⁶ Therefore, the overall distribution and combination of dermoscopic findings should be considered before deciding whether biopsy is warranted.

In the present study, 25 of the 29 histopathologically positive lesions were classified as suspicious on dermoscopy. Four positive lesions were not considered suspicious dermoscopically, demonstrating that dermoscopy, although highly useful, cannot completely replace histopathological examination. Conversely, 10 of the 56 histopathologically negative lesions were considered suspicious dermoscopically, demonstrating that false-positive dermoscopic impressions may occur because of overlapping features between benign and malignant lesions.

The sensitivity of dermoscopy in our study was 86.2%, while specificity was 82.1%. The positive predictive value was 71.4%, negative predictive value was 92.0% and overall diagnostic accuracy was 83.5%. These findings indicate that dermoscopy was particularly useful for identifying lesions unlikely to be histopathologically significant, as reflected by the high negative predictive value. Nevertheless, suspicious lesions require histopathological confirmation.

The diagnostic performance observed in the present study is broadly consistent with the established role of dermoscopy as an adjunct to clinical examination. Kittler et al. demonstrated that dermoscopy improves diagnostic accuracy for pigmented skin lesions compared with examination by unaided clinical inspection.⁵ More recent reviews continue to emphasize the value of dermoscopic algorithms and recognition of lesion-specific patterns in melanoma, melanocytic nevi and pigmented basal cell carcinoma.²⁰

Pigmented basal cell carcinoma was identified in six cases in our study. This entity can clinically mimic melanocytic lesions and other pigmented facial tumours. Dermoscopy can assist in its recognition by demonstrating characteristic structures. A systematic review and meta-analysis reported high pooled diagnostic performance of dermoscopy for basal cell carcinoma, with particularly useful performance for pigmented variants, although the authors also noted heterogeneity between studies.¹⁷

The presence of melanoma in four cases is clinically important despite its relatively small proportion of the total study population. Early melanoma may demonstrate subtle clinical findings, and dermoscopy can help identify architectural asymmetry, atypical pigment structures and multiple colours that warrant histopathological evaluation. Clinicopathological correlation studies have demonstrated that specific dermoscopic structures correspond to underlying histological changes in melanocytic lesions, thereby providing a biological basis for dermoscopic interpretation.^{13, 18}

Our findings also demonstrate the importance of combining global and local dermoscopic assessment. A single dermoscopic structure should not be interpreted independently because several benign and malignant lesions may share individual features. This is especially relevant for facial lesions, where follicular pigmentation, chronic photodamage and epidermal changes can produce patterns that mimic melanoma. Studies evaluating facial lentigo maligna and pigmented actinic keratosis have therefore emphasized the use of combinations of dermoscopic criteria rather than isolated signs.^{15, 16}

The present findings further support the concept that dermoscopy serves as an intermediate diagnostic step between naked-eye examination and histopathology. It may improve selection of lesions requiring biopsy and help clinicians determine the most appropriate area for sampling. In difficult facial lesions, additional non-invasive techniques such as reflectance confocal microscopy may also provide further information, particularly for lesions with equivocal clinical and dermoscopic findings.¹⁹

Recent developments in dermoscopy have focused on improving diagnostic algorithms and recognizing additional features associated with melanoma, melanocytic nevi and pigmented basal cell carcinoma. Musolff et al. highlighted continued refinement of established approaches such as the ABCDE rule and seven-point checklist, together with newer diagnostic algorithms and lesion-specific criteria.²⁰ These developments reinforce the importance of systematic dermoscopic examination rather than subjective assessment alone.

The three-way correlation in the present study showed complete concordance between clinical, dermoscopic and histopathological findings in 61 (71.8%) cases, partial concordance in 15 (17.6%) and discordance in 9 (10.6%). This demonstrates that although clinical examination remains the starting point, dermoscopy provides additional structural information and histopathology provides definitive confirmation. The discordant cases particularly illustrate why suspicious or atypical facial lesions should not be diagnosed exclusively on clinical or dermoscopic appearance.

Overall, the present study demonstrates that clinical examination, dermoscopy and histopathology are complementary rather than competing diagnostic modalities. Clinical assessment establishes the initial diagnostic framework, dermoscopy provides additional morphological information, and histopathology establishes the final diagnosis. The identification of 29 significant lesions among 85 patients also emphasizes the importance of systematic evaluation of pigmented facial lesions, particularly when atypical clinical or dermoscopic features are present.

Conclusion

Clinical, dermoscopic and histopathological assessment together provide a comprehensive approach to pigmented facial lesions. Dermoscopy demonstrated good diagnostic performance, with 86.2% sensitivity, 82.1% specificity and 83.5% diagnostic accuracy, while histopathology remained essential for definitive diagnosis of suspicious lesions.

Limitations

The study was limited by its relatively small sample size of 85 cases, single-centre design and potential observer-dependent variability in dermoscopic interpretation; therefore, larger multicentric studies are required to validate these findings.

Declarations

Conflicts of interest: There is no any conflict of interest associated with this study

Consent to participate: There is consent to participate.

Consent for publication: There is consent for the publication of this paper.

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