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Original Research Article.

A Study on Diagnostic Accuracy of Dermoscopy in Pigmented Basal Cell Carcinoma and Its Dermoscopic Features

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ABSTRACT

Background: Dermoscopy is an easy and non-invasive examination technique of evaluation of the colors and microstructures of the epidermis, dermoepidermal junction, and papillary dermis not visible to the naked eye. Many studies which demonstrate that it improves the diagnostic accuracy for pigmented skin lesions and has been mostly used in lesions of melanocytic origin. The aims of the present study were to 1) Study the diagnostic accuracy of dermoscopy in pigmented basal cell carcinoma. 2) Study the dermoscopic features.

Methods: A cross sectional study was carried out in OPD of a tertiary care hospital where all consecutive patients who were suspected to have pigmented basal cell carcinoma after clinical evaluation. This was followed by dermoscopic assessment and a presumptive diagnosis based on dermoscopic findings as per Menzies criteria was done followed by histopathologic evaluation after excision, which was considered gold standard for confirming the diagnosis.

Results: A total of cases 22 cases, suspected of PBCC were included.(M:F = 3:1) Sensitivity was calculated as 94.74%, Positive Predictive Value (PPV) 94.74% and accuracy of the device 90.9%. The most common features seen dermoscopically were asymmetry of the lesion (94.7%), ulceration/erosion (78.95%) and blue grey globules (68.42%). P value was <0.05%. However, small sample size could be a limitation in the study.

Keywords: Pigmented Basal Cell Carcinoma, Dermoscopy, Accuracy.

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INTRODUCTION

Dermoscopy also known as dermatoscopy, epiluminescence microscopy, amplified surface microscopy, and surface diascopy) is a non-invasive examination technique of evaluation of the colors and microstructures of the epidermis, dermoepidermal junction, and papillary dermis not visible to the naked eye; hence enhancing the diagnostic accuracy.[1,2] There have been a battery of studies which demonstrate that dermatoscopy improves the diagnostic accuracy for pigmented skin lesions, however all have focused on melanoma and melanocytic nevi, without adequately considering the fact that many pigmented lesions examined in routine clinical practice are not of melanocytic origin, examples being seborrheic keratoses, pigmented basal cell carcinoma and pigmented inflammatory conditions like lichen planus pigmentosus etc.

The aims of the present study were to 1) study the diagnostic accuracy of dermoscopy in pigmented basal cell carcinoma. 2) study the dermoscopic features.

METHODS

This was a prospective, cross sectional study. The study population included all consecutive patients coming to skin OPD who were suspected to have pigmented basal cell carcinoma after clinical evaluation. Informed consent was received from all patients. Institutional ethical committee clearance was obtained. A complete history taking & dermatological examination to note the type, pattern, number, duration of the lesions was done. For all lesions, macroscopic clinical photographs were taken. This was followed by dermoscopic assessment of those skin lesions using a videodermoscope having magnification upto 200x having both polarized and non-polarized lights. The immersion fluid used for enhancing translucency of skin was 70% ethanol based gel. Dermoscopic images could be seen on the laptop monitor connected to the videodermoscope and data recorded in the software. Documentation of the dermosopic finding in the performa was done.

A presumptive diagnosis based on dermoscopic findings according to previous described guidelines was done. This was followed by excisional biopsy and histopathology study of the lesion using routine haematotoxylin & eosin stain. Final diagnosis was taken from histopathologic evaluation which was considered gold standard for confirming the diagnosis. The single best diagnosis by clinical examination and the single best diagnosis given by dermoscopic evaluation were noted in the performa.

In the first step, the single best diagnosis from dermoscopic findings were compared with the histopathologic diagnosis to find the sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of the device. In the second step, the dermoscopic features of the histopathologically confirmed cases were recorded. Pre-established dermoscopic criterias for diagnosing a pigmented basal cell carcinoma must not have the negative feature of a pigment network include one of the following 6 criterias, described by Menzies[3]:

a. Arborizing telangiectasia (telangiectasia with ramification): telangiectasia with distinct treelike branching. They should be differentiated from hairpin loop telangiectasia.
b. Large gray-blue ovoid nests: well-circumscribed, confluent or near confluent pigmented ovoid or elongated areas, larger than globules, and not intimately connected to a pigmented tumor body.
c. Multiple gray-blue globules should be differentiated from multiple gray-blue dots (melanophages).
d. Ulceration, the absence of the epidermis often associated with congealed blood, when seen, should not be due to a well-described recent history of trauma.
e. Maple leaf like areas is brown to gray-blue discrete bulbous extensions forming a leaf like pattern. They should be distinguished from pseudopods because maple leaf areas are discrete pigment nests (islands) never arising from a pigment network and usually not arising from an adjacent confluent pigmented area.
f. Spoke wheel areas are well-circumscribed radial projections, usually tan but sometimes blue or gray, meeting at an often darker (dark brown, black, or blue) central axis.

Statistical Evaluation

The total number of True positive (TP), False positive (FP), True Negative (TN) and False Negatives (FN) were calculated. (Sensitivity = TP/TP+FN, Specificity = TN/TN+FP, Positive Predictive Value = TP/TP+FP**,** Negative Predictive Value = TN/FN+TN**,** Accuracy = TP+TN/Total number of cases)

All data was analysed with chi square test and p value was calculated. P value < 0.05 was taken to be significant.

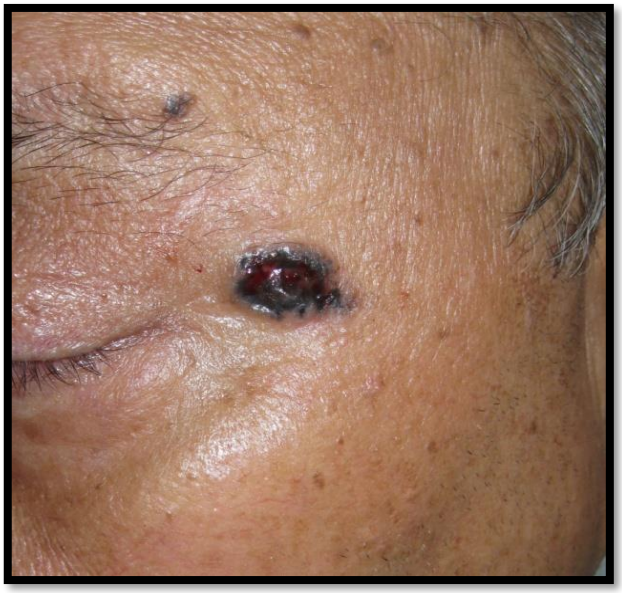


Fig 1: Pigmented BCC

VARIOUS TYPES OF DERMOSCOPIC FEATURES

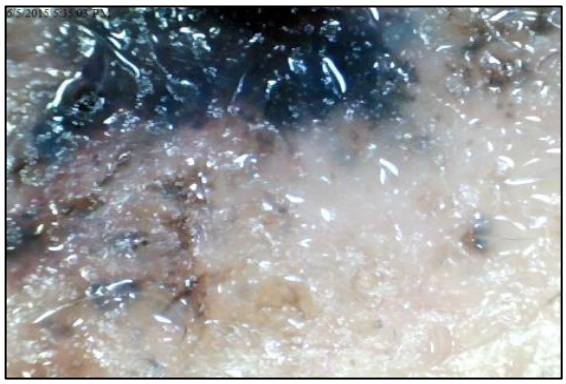


Fig 2(a): Large Blue grey nests

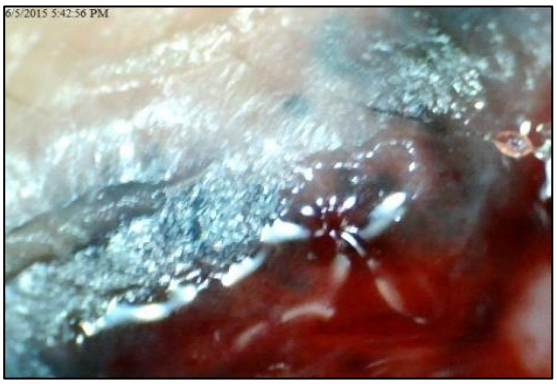


Fig 2 (b): Ulceration/Erosion

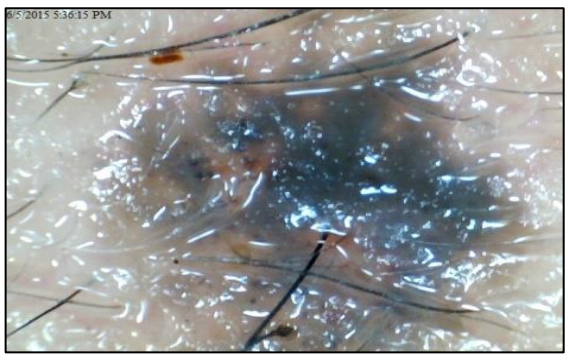


Fig 2 (c): Asymmetry, Blue-grey nests, absence of pigment network

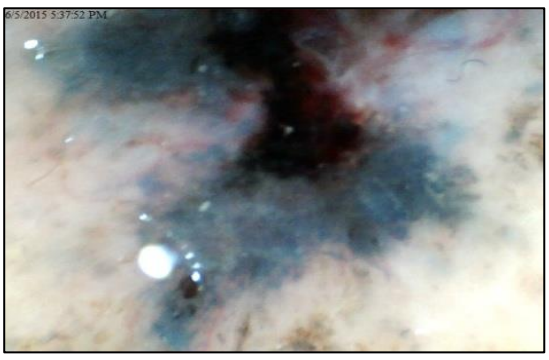


Fig 2 (d): leaf like structure, spoke wheel pattern, vascular structures (telangiectasia)

Table 1: Statistical analysis of dermoscopic and histopathological data.

Dermoscopic Diagnosis	Histopathological co-relation		Total
	Disease present	Disease absent	
Test Positive	18 (TP)	1(FP)	19
Test Negative	1(FN)	2 (TN)	3
Total	19	3	22

Sensitivity was calculated as:TP/(TP+FN) = 18 /18+1 = 94.74 %

Specificity = TN/(TN+FP) = 2/1+2 = 66.67 %

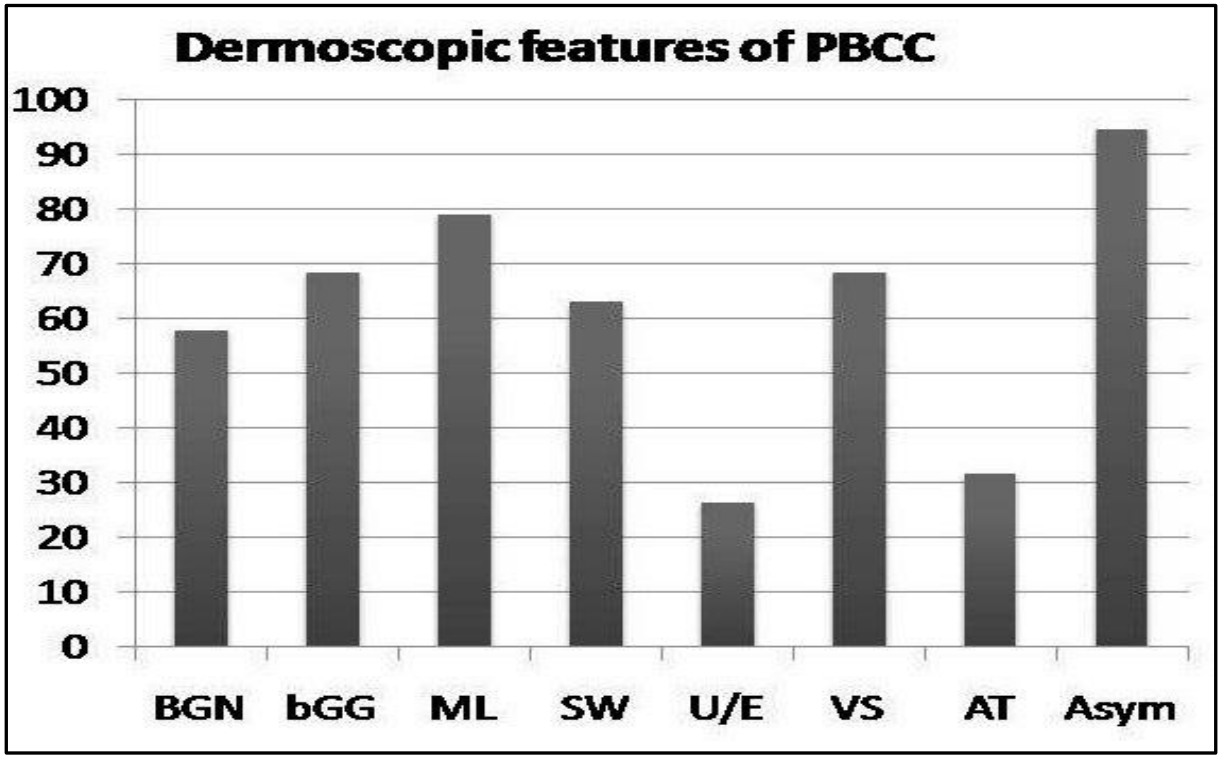
Positive Predictive Value (PPV) = TP/(TP+FP) = 18/18+1 = 94.74%

Negative Predictive Value (NPV) = TN/(TN+FN) = 2/2+1 = 66.67 %

Accuracy = TP +TN/Total cases = 18+2/22 = 20/22= 90.9%

Table 2: Dermoscopic Assessment of the features seen in histopathologically positive (n= 19) cases

DERMOSCOPIC FEATURES	Number of cases	Percentage of cases
1. Large blue grey or ovoid nests(BGN)	11	57.89 %
2. Blue Grey globules (bGG)	13	68.42 %
3. Maple leaf like areas (ML)	5	26.3%
4. Spoke wheel areas (SW)	12	63.16%
5. Ulcerations or erosions(U/E)	15	78.95 %
6. Vascular structures (telangiectasia)	13	68.4 %
7. Arborizing telangiectasia (only)(AT)	6	31.6 %
8. Asymmetry of the lesion	18	94.7 %



RESULTS & DISCUSSION

A total of cases 22 cases, suspected of PBCC were included. (M:F = 3:1) Dermoscopic features of pigmented BCCs were first reported by Puspok-Schwarz et al. In this report, dermoscopic features from 25 pigmented BCCs were compared with 25 melanomas. Arborizing telangiectasias were found in 52% of pigmented BCC and described as a strong model for diagnosis.[4] In this study, vascular structures could be seen in 68.4% cases and arborizing pattern of telangiectasia in 31.6% cases.

Menzies et al in 2000, conducted a study to describe the relevant morphologic features and to create a simple diagnostic method for PBCC using dermoscopy which was used in our study to calculate the accuracy of dermoscopy.[3] On an independent test set the model had a sensitivity of 97% for the diagnosis of pigmented BCCs and a specificity of 93% for the invasive melanoma set and 92% for the benign pigmented skin lesion set. In our study sensitivity for diagnosing PBCC using dermoscopy by using these devised criteria was maintained at 94.7%.

Demirtasoglu et al (2006), studied 32 PBCCs and found that dermoscopy had a diagnostic accuracy of 90% in detecting PBCCs while with unaided eye it was 60 %.[5] In this study, diagnostic accuracy with dermoscope was maintained at 90.9 %.

Chan GJ et al, in 2008, used the Menzies' criteria and found a sensitivity of 97.0% and specificity of 93.4% of the proposed method to diagnose PBCCs in chineese population.[6] The sensitivity in our study was also similar (94.7%), however specificity was lower (66.67%).

Akay BN et al, examined 130 skin lesions with preliminary diagnosis of BCC with documentation of dermoscopic findings and followed by histopathological analysis. Preoperative diagnostic accuracy rate of dermoscopy in the diagnosis of BCC was found to be 95.3%.[7] Altamura et al in an analysis of 609 BCCs, reported a sensitivity of 97% in dermoscopic diagnosis of BCCs. However the lesions studied were constituting 85% PBCCs and 15% of non-pigmented BCCs.[8] In our study, sensitivity was similar (94.7%) and it had included only pigmented BCCs. 90% of tumours were correctly diagnosed as PBCCs with the method described by Menzies et al. which is similar to the study conducted by Terstappen et al, like ours.[9] In a study by Rosendahl et al which included 463 lesions of which 72 were PBCCs, found a sensitivity of 98.6% for detection of PBCCs.[10]

Dermoscopic features in PBCCs

In the study by Menzies et al, of all features, arborizing telangiectasia were the most robust diagnostic feature, being present in 52% of PBCCs. Blue grey nests (BGN) were present in 55%, Blue grey Globules (bGG) in 27%, ulceration (U/E) in 27%, Maple leaf (ML) like areas in 17% and spoke wheel (SW)in 10% cases.[3]

In a study by Jwa SW et al, all PBCCs satisfied dermoscopic criteria for diagnosis as suggested by Menzies et al. Negative features such as a pigment network were not observed in all PBCCs. Positive features – U/E, BGN, bGG, ML, SW and AT were present in 39 (78.0%), 41 (82.0%), 33 (66.0%), 21 (42.0%), 1 (2.0%) and 32 (64.0%) of 50 PBCCs respectively.[11]

In the study by Altamura et al, a total of 517 PBCCs were evaluated. Common dermoscopic feature seen were BGN (55.9%), AT (52.4%), U/E (37.5%), bGG (30.6%), ML (18.8%), and SW (10.6%).[8] Frequency of occurrence for same structures in our study were 57.89%, 31.6%, 78.9%, 78.95%, 26.3% and 63.16% respectively and non-arborizing vessels in 36.8% cases. Other dermoscopic features for diagnosing PBCCs suggested by Altamura et al includes short fine superficial telangiectasia, concentric structures, multiple in-focus blue/gray dots and dermatoscopic features suggestive of melanocytic lesions (eg, multiple brown to black dots/globules, blue/white veil like structures). However these were not found in our study and probably a larger sample size is required to know their occurrence in Indian skin type.

In the study on BCCs by Akay BN et al, of the pigmented variety, most common dermoscopic feature seen was vascular structures (55%) followed by ML (50%), BGN (45%), U/E(35%), bGG (35%), SW (10%). Frequency of occurrence for same structures in our study were 68.4%, 26.3%, 57.89%, 78.9%, 68.42% and 63.16% respectively. Higher occurrence of ulceration may be due to later presentation of the disease. Additional features seen in their study were whitish veils, grey dots, milia like cysts, comedo like openings, but were not be found in our study.[7]

Trigoni et al, studied dermoscopic features in different types of basal cell carcinoma of which included a total of 138 lesion & amongst them,102 were PBCCs. Dermoscopic features seen AT(74%), featureless areas (79%), U/E(26%), bGG (21%), BGN (18%), ML (6%) & SW (6 %).

In a recent study in 2015, by Emiroglu et al on 98 BCCs most common dermoscopic features in PBCCs as follows: Pigmented islands (BGN and bGG- 42.9%), AT (23.5%), white streaks/areas (23.5%) and a pigment pattern (ML and SW– 17.6 %). In our study too, incidence of pigment islands and patterns were higher.[13] Asymmetric nature of the lesion was seen in 94.7% of the lesions.

Limitations in this study were a smaller sample size. Subjects included clinically selected cases rather than randomly selected lesions. Therefore there is a possibility of selection bias affecting the true outcome.

CONCLUSION

Dermoscopic evaluation is easy and non-invasive technique which improves the diagnostic accuracy of melanocytic and non-melanocytic pigmented skin lesions. This study was demonstrates that dermoscopy improves the diagnostic accuracy for PBCCs. Short algorithms based on pattern analysis in dermoscopy are easy to apply and achieve a high sensitivity in their diagnosis. However, the diagnostic accuracy of dermoscopy does not reach 100% even under optimum conditions, indicating that demoscopy cannot replace histopathology. But may may provide useful additional information for the histopathologist and clinician in difficult cases and be regarded as concurrent examinations of a joint diagnostic procedure with additive information.

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