OBSERVATIONAL STUDY

A descriptive study on the clinical, dermoscopic and histopathologic features of pigmented skin lesions among Filipino adults

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Background: Dermoscopy increases the diagnostic accuracy of clinical visual inspection by 5% to 30%. This has led to a reduction of unnecessary excision of benign skin lesions and the earlier diagnosis of malignant skin lesions.

Objectives: To compare the concordance agreement of the clinical versus histopathologic diagnosis to the concordance agreement of the dermoscopic versus histopathologic diagnosis of pigmented lesions.

Research Design: This is a prospective, cross-sectional study of the clinical, dermoscopic and histopathological features of pigmented skin lesions on patients seen at the Out-Patient Departments of Quirino Memorial Medical Center and Ospital ng Makati from March 2013 to June 2014.

Methods: Sixty-eight subjects fulfilled the criteria and were all included in the final analysis. Classification and definitive diagnosis of the lesion as benign or malignant were determined thru clinical, dermoscopic and histopathologic features by one dermatopathologist. Kappa and concordance analyses were performed to determine the statistical and concordance agreement among the results of the three diagnostic procedures, respectively.

Results: The statistical agreement between clinical versus histopathologic classification as benign or malignant was good (kappa=0.872), while the statistical agreement was high (kappa=0.872) between dermoscopic versus histopathologic classification. Concordance agreement between clinical versus histopathologic diagnosis showed fair agreement (concordance coefficient=0.2397) as compared to a high agreement (concordance coefficient=0.98) in dermoscopic versus histopathologic diagnosis.

Conclusion: The use of dermoscopy in pigmented lesions aids the dermatologist in giving an accurate diagnosis without invasive procedures. Knowledge of the dermoscopic features will help in the early clinical detection and management of benign and malignant pigmented skin lesions.

Keywords: dermoscopy, pigmented skin lesions

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INTRODUCTION

An alarming increase in melanomas, squamous cell carcinoma (SCC) and basal cell carcinoma (BCC) has been observed in the last two decades. [1,2] Diseases diagnosed in the early stages are highly curable while diseases in the advanced stages carry an unfavorable prognosis.

The 10-year survival rate of early melanoma is 90-97%. This significantly drops when it becomes an advanced melanoma with a five-year survival rate of 10-15%.[3] In SCC, appropriate treatment of small lesions (≤1 cm in diameter) can eliminate up to 90% of the local tumors. However, SCC treated at an advanced stage has a 10-year survival rate of 10-20%.[4] BCC is another skin cancer which is highly curable when detected and treated early.[5] Once a BCC reaches an advanced stage, the mean survival rate drops to 8 to 10

months.[6] Hence, prompt and correct diagnosis is particularly important because lesions treated in the early stages have excellent prognosis and is potentially lifesaving.[7]

Histopathology is the gold standard in diagnosing benign and malignant skin lesions.[8] Since most of the skin cancers in the early stages are localized to the skin, it is therefore detectable by simple examination. Technological innovations, like the use of dermoscopy, now permit the diagnosis of pigmented skin lesions without performing invasive procedures.

The use of a dermoscope allows the visualization of the surface and subsurface of a pigmented skin lesion.[9,10] The epidermis, dermo-epidermal junction and, the superficial papillary dermis are all visualized. This procedure is useful in differentiating melanocytic from non-melanocytic lesions.[11] Argenziano et al. developed a two-step procedure in classifying pigmented lesions with the use of a dermoscope: first, determining if a lesion is melanocytic or non-melanocytic; second, determining if it's benign or malignant.[12] With the use of a dermoscope, the diagnostic accuracy of clinical visual inspection increases by 5% to 30%. With the use of this device, prompt and appropriate treatment of pigmented lesions is performed earlier, and unnecessary operation is avoided.[13-15]

In the Philippines, dermoscopy is increasingly being recognized as an effective point of care of method of diagnosis. In a study involving 49 Filipino patients with pigmented lesions, the sensitivity and specificity of teledermoscopy for diagnosing malignant pigmented lesions was 100% and 70.2%, respectively. This tool had a comparable diagnostic accuracy with histopathology in diagnosing malignant pigmented skin lesions.[16]
This study demonstrates the comparability of dermoscopy to histopathology in the diagnosis of pigmented skin lesions.

OBJECTIVES

The general objective of the study is to compare the concordance agreement of the clinical versus histopathologic diagnosis to the concordance agreement of the dermoscopic versus histopathologic diagnosis of a pigmented lesion in patients seen at the Dermatology Out-Patient Departments of Quirino Memorial Medical Center and Ospital ng Makati from March 1, 2013, to June 30, 2014.

The specific objectives of the study are: to determine thru clinical, dermoscopic and histopathologic features if a lesion is benign or malignant and compare the statistical agreement using kappa analysis of clinical versus histopathologic to the statistical agreement of dermoscopic versus histopathologic classification as benign or malignant. To describe the clinical features of benign and malignant, melanocytic and non-melanocytic pigmented skin lesions. To describe the dermoscopic features of benign and malignant, melanocytic and non-melanocytic pigmented skin lesions. Lastly, to describe the histopathologic features of benign and malignant, melanocytic and non-melanocytic pigmented skin lesions.

METHODOLOGY

This is a prospective, cross-sectional study approved by our local Institutional Review Board (IRB), conducted from March 1, 2013, to June 30, 2014, at the Dermatology Out-Patient Departments of Quirino Memorial Medical Center and Ospital ng Makati. Sample size computation was based on a study by Ferrera et al[17], 107 melanocytic skin lesions were retrospectively examined by eight dermoscopists and eight histopathologists. Interobserver agreement, calculated using the Schouten k statistics, was good for both dermoscopy and histopathology. Forty out of 48 cases agreed (0.833 positive rating) with a 0.53 weighted kappa, the sample size computed is at 90% power level. This sample size was computed using the sample size table for kappa statistic[18] wherein the favorable rating is set at 0.90 (nearer to 0.833) and 0.50 kappa to detect (near to 0.53 of the reference study). The null hypothesis is set at 0.00 under 95% confidence interval because we assume the null hypothesis is accepted if the two measured variables do not agree.

We recruited patients who had pigmented lesions for excisional or incisional biopsy. The patients were 18 years old or older, who had pigmented skin lesions on the face, trunk, or extremities. Excluded is the study were lesions were on the acral skin or nails, pregnant, breastfeeding, immunosuppressed and allergic to lidocaine with or without epinephrine (Figure 1).

Demographic data for each patient were gathered, including age and sex. Based on the clinical and dermoscopic features, the lesions were classified as melanocytic or non-melanocytic followed by classification to either benign or malignant. The clinical diagnoses were assessed by a dermatopathologist. Images of the clinical features of the pigmented skin lesions were documented using a digital Ixus 115 HS Canon camera. Dermoscopic images were taken using a dermoscope (3Gen-polarized Dermlite, 3Gen Inc., California) mounted on a digital Ixus 115 HS Canon camera. Alcohol gel was used for better dermoscopic imaging and hygienic purposes.

A punch, incision or excision biopsy was performed to obtain the histopathologic features of the skin lesions. The specimens were fixed in buffered 10% formalin for 48 hours, embedded in paraffin, sectioned at 5mm thickness and stained with hematoxylin and eosin. Histopathologic features and classification (melanocytic versus non-melanocytic; benign versus malignant) were assessed by

the same dermatopathologist. Patients with malignant lesions were advised to undergo complete excision.

Sixty-eight lesions were included in the final statistical analyses. Missing data were neither replaced nor estimated. Descriptive statistics were used to summarize the demographic profile of the patients. To determine the statistical agreement between the results of the three diagnostic procedures, kappa values and, concordance analyses were computed. STATA IC12 was used in data processing and analysis.

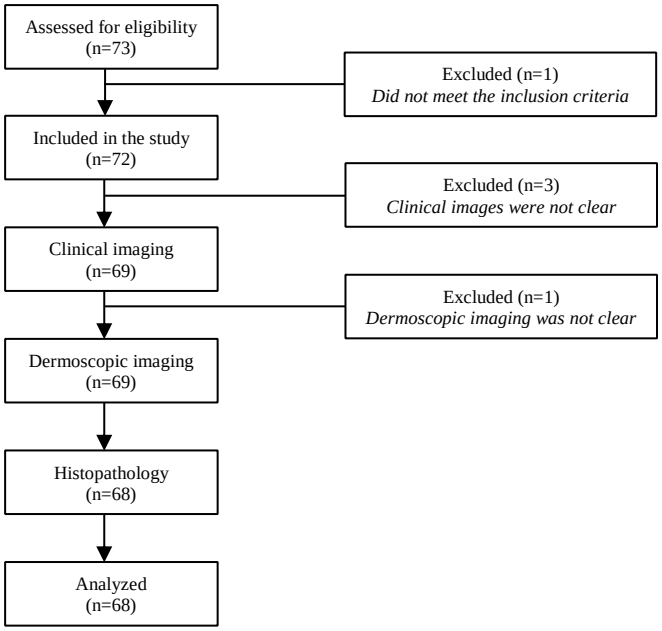

Figure 1. Patient flow diagram

RESULTS

A total of 68 lesions from 68 healthy adult Filipino patients were included in the study. The patients were predominantly female (79%) with a wide age range (48 ± 20 years). Seventy-four percent of the subjects sought consult for pigmented lesions on the face and 26% on the trunk or extremities (Table 1). Among the lesions obtained, 52.9% were melanocytic and 47.1% were non-melanocytic (Table 2). The most common diagnoses were melanocytic nevi (52.9%) and seborrheic keratosis (SK) (33.8%). We also detected BCC (10.3%), SCC (1.5%), and verruca vulgaris (VV) (1.5%) but there was no melanoma (Table 2).

The kappa analysis was used to test the agreement between variables of the same units. This statistic ranges from 0 to 1 wherein the acceptable threshold is 0.600. Clinical versus histopathologic classification as benign or malignant present a kappa of 0.872 which means that there is a good level of agreement between the two variables. (Table 3).

Age	47.98 ± 20.28
Sex	
Male	14 (21%)
Female	54 (79%)
Location of lesion	
Face	50 (74%)
Trunk/extremities	18 (26%)

Table 1. Age, sex, and anatomical distribution of lesions in the 68 Filipino adults with pigmented skin lesions at QMMC and OsMak from March 2013 to June 2014

Clinical diagnosis	**n (%)**
Benign	
Melanocytic nevus	34 (50.0%)
Seborrrheic keratosis	20 (29.4%)
Cutaneous horn	1 (1.5%)
Pyogenic granuloma	1 (1.5%)
Benign with atypical features	
Dysplastic nevus	2 (2.9%)
Malignant	
BCC	9 (13.2%)
Keratoacanthoma	1 (1.5%)
Dermoscopic diagnosis	**n (%)**
Benign	
Melanocytic nevus	36 (52.9%)
Seborrrheic keratosis	22 (32.4%)
Verruca vulgaris	1 (1.5%)
Inconclusive, with benign features	1 (1.5%)
Malignant	
BCC	7 (10.3%)
BCC vs SCC	1 (1.5%)
Histopathologic diagnosis	**n (%)**
Benign	
Melanocytic nevus	36 (52.9%)
Compound	18 (26.5%)
Intradermal	17 (25.0%)
Congenital	1 (1.5%)
Seborrheic keratosis	23 (33.8%)
Verruca vulgaris	1 (1.5%)
Malignant	
BCC	7 (10.3%)
SCC	1 (1.5%)

Table 2. Clinical, dermoscopic, and histopathologic diagnoses

Histopathologic Diagnosis	Clinical Diagnosis		Total	Weighted Kappa	95% CI
	Benign	Malignant			
Benign	58	2	60 (88.2%)	0.872 *Good agreement*	0.699 to 1.000
Malignant	0	8	8 (11.8%)		
Total	58	10	68		
	-85.30%	-14.70%			

Table 3. Agreement between clinical vs histopathologic classification as benign or malignant

Histopathologic Diagnosis	Dermoscopic Diagnosis			Total	Weighted Kappa	95% CI
	Benign	Malignant	Inconclusive			
Benign	59	0	1	60 (88%)	0.933 *High agreement*	0.805 to 1.000
Malignant	0	8	0	8 (12%)		
Total	59	8	1	68		
	-87.00%	-12.00%	-1.00%			

Table 4. Agreement between dermoscopic vs histopathologic classification as benign or malignant

Histopath Diagnosis	Clinical Diagnosis									Total
	BCC	CN	SK	VV	SCC	KA	PG	CH	DMN	
BCC	7	0	0	0	0	0	0	0	0	7 (10.3%)
CN	0	32	2	0	0	1	0	0	1	36 (52.9%)
SK	1	1	18	0	0	0	1	1	1	23 (33.8%)
VV	0	1	0	0	0	0	0	0	0	1 (1.5%)
SCC	1	0	0	0	0	0	0	0	0	1 (1.5%)
KA	0	0	0	0	0	0	0	0	0	0 (0.0%)
PG	0	0	0	0	0	0	0	0	0	0 (0.0%)
CH	0	0	0	0	0	0	0	0	0	0 (0.0%)
DMN	0	0	0	0	0	0	0	0	0	0 (0.0%)
Total	**9**	**34**	**20**	**0**	**0**	**1**	**1**	**1**	**2**	**68**
	-13.20%	**-50.00%**	**-29.40%**	**0.00%**	**0.00%**	**-1.50%**	**-1.50%**	**-1.50%**	**-2.90%**	
Concordance Coefficient:				**0.2397**						
Accuracy:				**73.04%**						
Interpretation:				**Fair**						

BCC = Basal cell carcinoma, CN=Compound nevus, SK=Seborrehic keratosis, VV=Verruca vulgaris, SCC=Squamous cell carcinoma, KA=Keratoacanthoma, PG=Pyogenic granuloma, CH=Cutaneous horn, DMN=Dysplastic melanocytic nevi

Table 5. Concordance agreement between clinical vs histopathologic diagnosis

Histopath Diagnosis	Dermoscopy Diagnosis						Total
	BCC	Nevi	SK	SCC	VV	Inconclusive	
BCC	7	0	0	0	0	0	7 (10.29%)
Nevi	0	36	0	0	0	0	36 (52.94%)
SK	0	0	22	0	0	1	23 (33.82%)
SCC	0	0	0	1	0	0	1 (1.47%)
VV	0	0	0	0	1	0	1 (1.47%)
Total	**7**	**3**	**22**	**1**	**1**	**1**	**68**
	10.29%	**52.94%**	**32.35%**	**1.47%**	**1.47%**	**1.47%**	
Concordance Coefficient:		**0.98**					
Accuracy:		**99.40%**					
Interpretation:		**High agreement**					

BCC Basal cell carcinoma, Nevi=Melanocytic nevi, SK=Seborrehic keratosis, VV=Verruca vulgaris, SCC=Squamous cell carcinoma

Table 6. Concordance agreement between dermoscopic vs histopathologic diagnosis

Dermoscopic versus histopathologic classification presented a kappa of 0.933, which means that there is a high agreement between the two variables (Table 4).

Concordance analysis of histopathologic and dermoscopic diagnoses showed a fair agreement between the determination of the pigmented skin lesions, with a concordance coefficient of 0.2397 (Table 5). On the other hand, results from dermoscopic versus histopathologic diagnoses showed that there was a high agreement between the diagnosis of the pigmented skin lesions, with a concordance coefficient of 0.980 (Table 6).

Discussion

We checked for agreement between the benign or malignant classification and the diagnoses. Generally, the kappa value has a good agreement between clinical versus histopathologic classification as benign or malignant. The kappa value improved to a high agreement in dermoscopic versus histopathologic classification as benign or malignant. This improvement was also noted in the concordance analysis in the diagnosis of the lesion. The agreement was only fair between clinical versus histopathologic diagnoses as compared to high agreement between dermoscopic versus histopathologic diagnoses.

The results imply that the use of dermoscopy significantly increases the accuracy of the classification and diagnosis of skin lesions than clinical diagnosis alone. It is a comparable alternative to histopathologic diagnosis, which is the gold standard.

There were 36 melanocytic lesions and 32 non-melanocytic lesions. All of the melanocytic lesions were benign nevi. Among the melanocytic nevi on the face and trunk, the globular pattern was notably the most common (Tables 7 and 8). Most compound nevi (Figure 2A) presented with a predominantly globular pattern on a background of a structureless area (Figure 2B). These globules are nests of melanocytes or melanophages within stratum corneum, epidermis, dermo-epidermal junction, or papillary dermis (Figures 2C, 2D). According to Argeziano et al., globules are black, brown or grey round to oval, variously sized structures which are regularly distributed within a melanocytic nevus. However, irregularity of these globules should increase suspicion for melanoma.[19]

A case of congenital melanocytic nevus (Figure 3A) presented with the following dermoscopic features: homogeneous, brown and blue-black pattern (Figure 3B). Histopathology showed (Figure 3C, 3D) nests of melanocytic nevus cells scattered in the papillary dermis and deep down to the reticular dermis, involving the adnexae. In the Atlas of Dermoscopy by Margoob et al., they reported that there are four patterns commonly seen in congenital melanocytic nevus, reticular, globular, reticulo-globular with globules in the center and network at the periphery and diffuse brown pigmentation. Diffuse pigmentation, as in our patient, is the least common and has a frequency of 4%.[20]

Rarely, telangiectasia can be seen in benign lesions. In a patient with intradermal nevus (Figure 4A), short hairpin-like vessels were observed (Figure 4B). These are dilated vessels in the papillary dermis (Figure 4C). In particular, comma-like vessels characterized are key dermoscopic features of intradermal nevus with a positive predictive value of 94%.[21]

Patterns for melanocytic nevi		Benign (n=31)	Malignant(n=0)
Metaphoric terminology	**Descriptive terminology**		
Reticular patterns	Lines, reticular	1 (3.2%)	0 (0.0%)
Globular pattern	Clods, small, round or oval	27 (87.1%)	0 (0.0%)
Homogenous pattern	Structureless zone	0 (0.0%)	0 (0.0%)
Starburst pattern	Lines, reticular around central clods	0 (2.4%)	0 (0.0%)
Non-specific pattern		2 (6.5%)	0 (0.0%)
Others			
Hairpin-like; comma-shaped	Looped; curved vessels	2 (6.5%)	0 (0.0%)
Comedo-like opening	Clods, yellow to brown-black	2 (6.5%)	0 (0.0%)
Blue-gray veil	Structureless zone, blue	1 (3.2%)	0 (0.0%)

Table 7. Dermoscopic features of benign vs malignant melanocytic lesions on the face

Patterns for melanocytic nevi		Benign (n=5)	Malignant (n=0)
Metaphoric terminology	**Descriptive terminology**		
Reticular patterns	Lines, reticular	0 (0.0%)	0 (0.0%)
Globular pattern	Clods, small, round or oval	3 (60.0%)	0 (0.0%)
Homogenous pattern	Structureless zone	1 (2.0%)	0 (0.0%)
Starburst pattern	Lines, reticular, around brown clods	0 (0.0%)	0 (0.0%)
Non-specific pattern		0 (0.0%)	0 (0.0%)
Others Cerebriform configuration	Lines, curved and think	2 (40.0%)	0 (0.0%)

Table 8. Dermoscopic features of benign vs malignant melanocytic lesions on the trunk or extremities

Most non-melanocytic lesions were benign (75%), these were SK and VV. The non-melanocytic malignant lesions (25%) were BCC and SCC (Table 2).

Predominant dermoscopic features of SK (Figures 5A, 6A, and 7A) were comedo-like openings (58.3%), milia-like cysts (20.8%) and cerebriform configuration (29.2%) (Table 9).

Comedo-like openings are round keratotic structures protruding from the surface of the hair follicle of SK (Figure 5B). This represents intraepidermal pseudohorn cyst reaching the surface (Figure 5C). On the other hand, milia-like cysts are embedded round structures (Figure 6B) similar to comedo-like openings but are seen underneath the surface. On histopathology, these are intraepidermal pseudo-horn cysts (Figure 6C). Cerebriform configuration (Figure 7B) is manifested due to its papillomatous proliferation (Figure 7C).

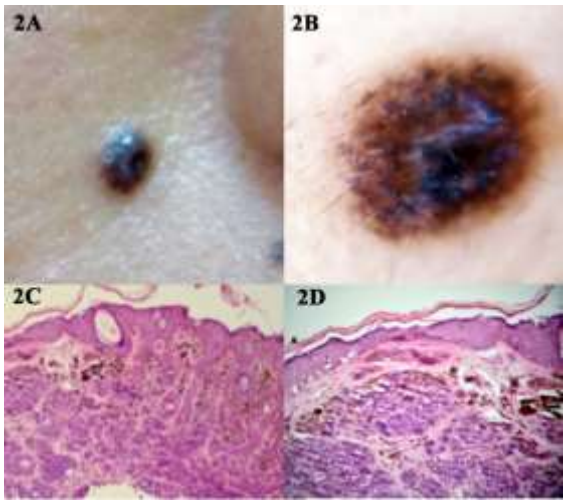

Figure 2A. The clinical picture of compound nevus showing dark brown-black dome-shaped papule. **2B.** Dermoscopic features were a globular pattern on a background of diffuse brown pigmentation. **2C.** Histopathology revealing nests of nevomelanocytic cells scattered in the epidermis and upper dermis, which correspond to globules on dermoscopy. **2D.** The degree of melanization and depth of location of the nevomelanocytic nests result in globules with different colors on dermoscopy.

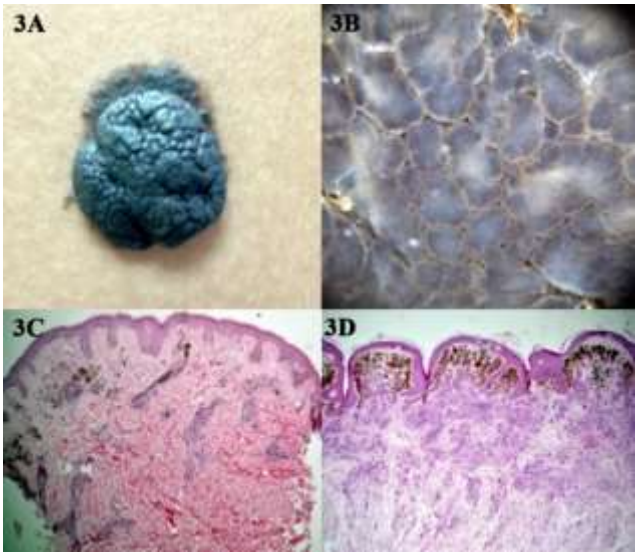

Figure 3A. Congenital nevus on the back showing exophytic polypoid brown-black nodule and a plaque component. **3B.** Dermoscopic features of diffuse brown-black homogenous pigmentation. **3C.** Histopathologic features were nests of melanocytic nevus cells scattered in the papillary dermis and deep down to the reticular dermis, involving the adnexae. **3D.** A magnified view of melanocytic nests.

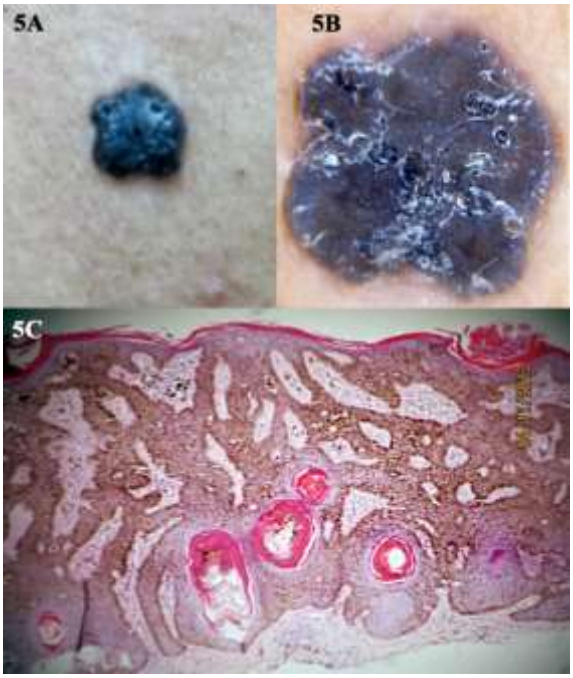

Figure 5A. Macroscopic picture of SK on the chest showing irregularly shaped plaque with stuck-on appearance. **5B.** Dermoscopic features were sharply demarcated lesion with comedo-like openings. **5C.** Histopathologic findings of acanthosis, hyperkeratosis, pigmented keratinocytes, keratin-filled invagination on the surface of the epidermis and pseudo-horn cysts embedded within the epidermis consistent with SK, acanthotic type.

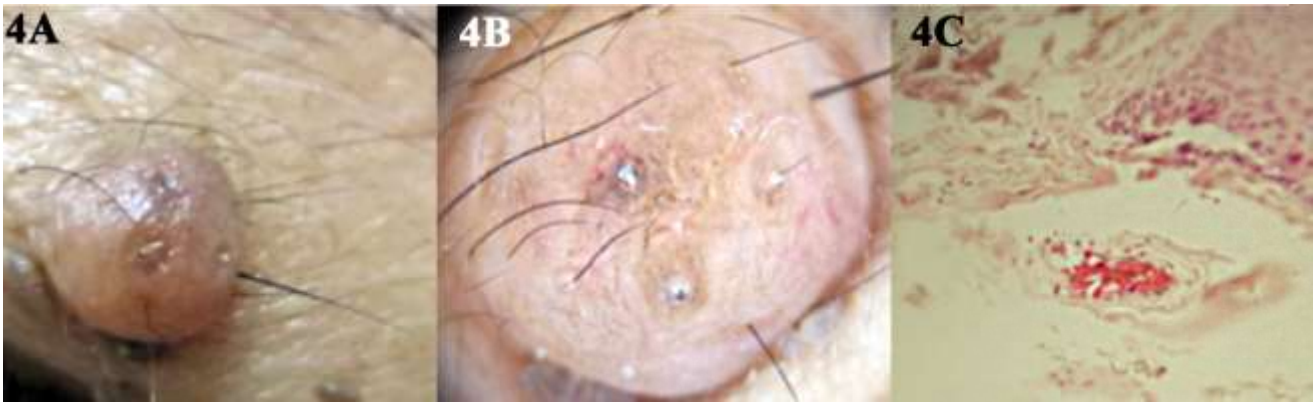

Figure 4A. Macroscopic picture of an intradermal nevus on the eyelid showing a skin-colored dome-shaped papule. 4B. Linear vessels were seen on dermoscopy. **4C.** Dilated blood vessels in the upper dermis.

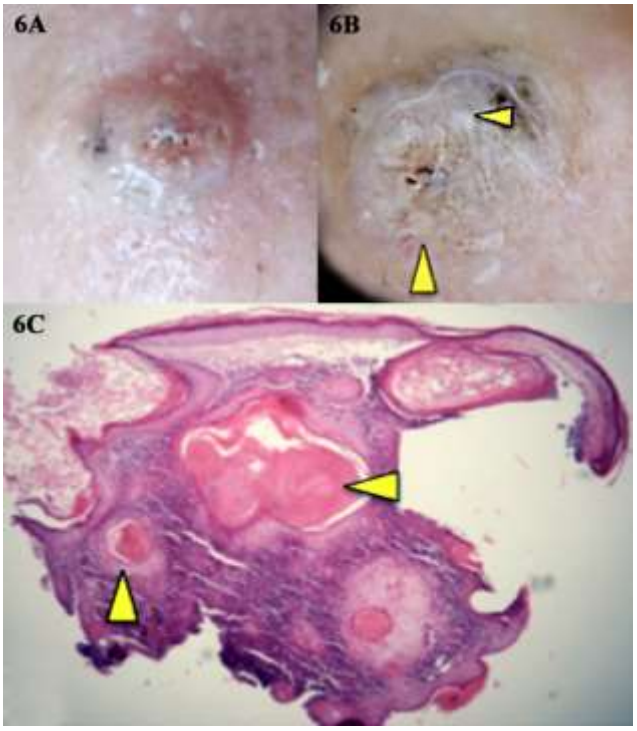

Figure 6A. Macroscopic picture of SK on the nose. **6B**. Multiple milia-like cysts (yellow arrowhead) pointed on dermoscopy. **6C.** Histopathologic features were consistent with SK showing epidermal proliferation, hyperplasia, and pseudo-horn cysts embedded within the epidermis (yellow arrowhead).

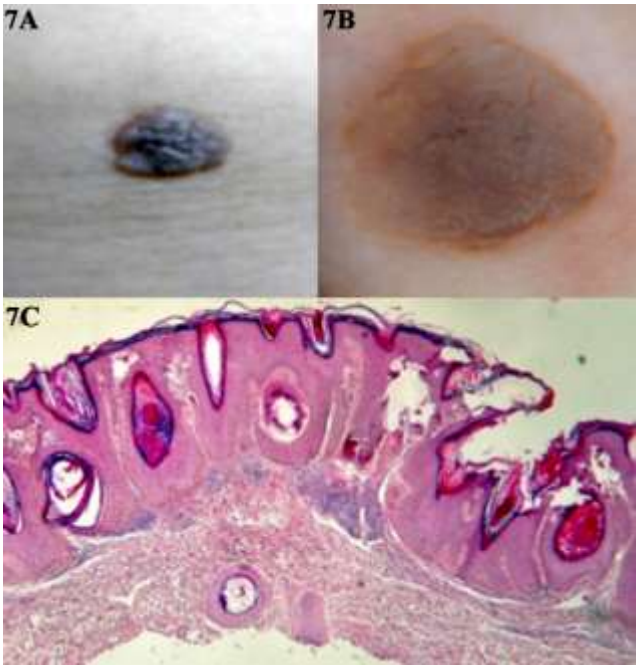

Figure 7A. Clinical picture of SK. **7B.** Dermoscopy showed cerebriform configuration. **7C.** The histopathologic assessment was consistent with SK, papillomatous type, showing epidermal proliferation, hyperkeratosis, and papillomatosis with pseudo-horn cysts embedded within the epidermis.

Milia-like cysts and comedo-like openings were highly suggestive of seborrheic keratosis. In the study by Braun et al., they evaluated 203 seborrheic keratosis lesions, milia-like cysts, comedo-like openings, and cerebriform configuration were seen in 71%, 66%, and 61%, respectively.[22] Hairpin vessels was reported by Ahlgrimm-Siess et al. as a feature that aids in the diagnosis of seborrheic keratosis, however, this was not seen in our study.[23]

VV (Figure 8A) showed black dots on dermoscopy (Figure 8B). These represent dilated capillaries on histopathology (Figure 8C, 8D, 8E).

Out of the eight malignant non-melanocytic lesions, 7 were BCC. On dermoscopy, the majority of the BCC presented with arborizing vessels (75%) and blue-gray blotches (62.5%). Other dermoscopic features were white veil, microulceration, and leaf-like structure (Table 9). The featured case of BCC (Figure 9A), showed arborizing vessels, blue-gray blotches, and microulceration. Blue-gray blotches are blue or brown to gray pigmentation with an irregular shape (Figure 9B). These blotches correspond to solid aggregations of basaloid cells with peripheral palisading in the papillary dermis (Figure 9C). Arborizing blood vessels are vessels of large diameter that branch irregularly into fine terminal capillaries. Ulcerations are dull red to brown, irregularly shaped areas on dermoscopy (Figure 9B). This represents ulceration of the epidermis with a hemorrhagic crust.

Arborizing telangiectasia is the vascular pattern most significantly associated with BCC (positive predictive value of 94%).[21] According to Trigoni et al., the most valuable diagnostic criteria for BCC are blue-gray blotches, ulceration, hypopigmented areas, arborizing vessels, atypical red vessels, and featureless areas.[24] Interestingly, the first four of these features were seen in our study. In contrast, according to Martin et al., characteristic features of BCC are arborizing vessels, multiple blue-gray globules, maple leaf-like areas, blue-gray ovoid nests, and spoke wheel areas.[21] The first three of these six features were seen in our study.

A case of squamous cell carcinoma in situ was seen (Figure 10A). Dermoscopy showed keratin mass on an erythematous base with glomerular vessels. The keratin masses are visualized as yellow-white to light brown structures. At the periphery, brownish structureless areas with a reticular pattern were noted. (Figure 10B). On histopathophology revealed scale crust with features of squamous cell carcinoma in situ (Figure 10C).

The two dermoscopic features seen in our study were similar to the SCC cases of Zalaudek et al. In this study, the keratin mass and erythema were significantly associated with squamous cell carcinoma. Additional features were hairpin vessels, linear-irregular vessels, targetoid hair follicles, white structureless areas, and ulceration in their SCC cases.[25]

Metaphoric terminology	Descriptive terminology	Benign (n=24)	Malignant (n=8)
Blue-gray blotches	Structureless zone	0 (0.0%)	5 (62.5%)
Arborizing vessels	Serpentine	0 (0.0%)	6 (75.0%)
Milia-like cysts	Clods, dots white, yellow, clustered or disseminated	5 (20.8%)	0 (0.0%)
Comedo-like openings	Clods, brown, yellow or orange	14 (58.3%)	0 (0.0%)
Red-blue lacunes	Clods, red-blue	0 (0.0%)	0 (0.0%)
Central white patch	Structureless zone, white, central	0 (0.0%)	0 (0.0%)
Others Cerebriform configuration	Lines, curves and thick	7 (29.2%)	0 (0.0%)
Crusted		4 (16.7%)	1 (12.5%)
Pseudonetwork	Structureless, brown, interrupted by follicular openings	1 (4.2%)	0 (0.0%)
Ulcer		1 (4.2%)	2 (25.0%)
Black dots	Dots, black	1 (4.2%)	0 (0.0%)
White veil	Structureless, zone, white	0 (0.0%)	1 (12.5%)
Leaf-like	Lines, radial, connected to a common base	0 (0.0%)	1(12.5%)

Table 9. Dermoscopic features of benign vs malignant non-melanocytic lesions

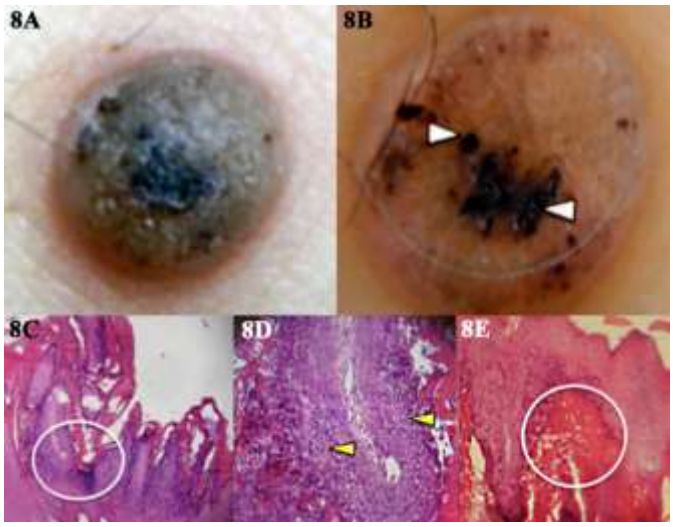

Figure 8A. Macroscopic picture of VV characterized as dome-shaped papule with a verrucous surface. **8B.** Dermoscopy showed thrombosed capillaries (white arrowhead). **8C.** The histopathologic picture showed hyperkeratosis, papillomatosis, and tear of parakeratosis. **8D.** Higher magnification revealed koilocytes with pyknotic nuclei, perinuclear halo and coarse kertaohyalin granules (yellow arrowhead). **8E.** Dilated and thrombosed capillaries (white circle).

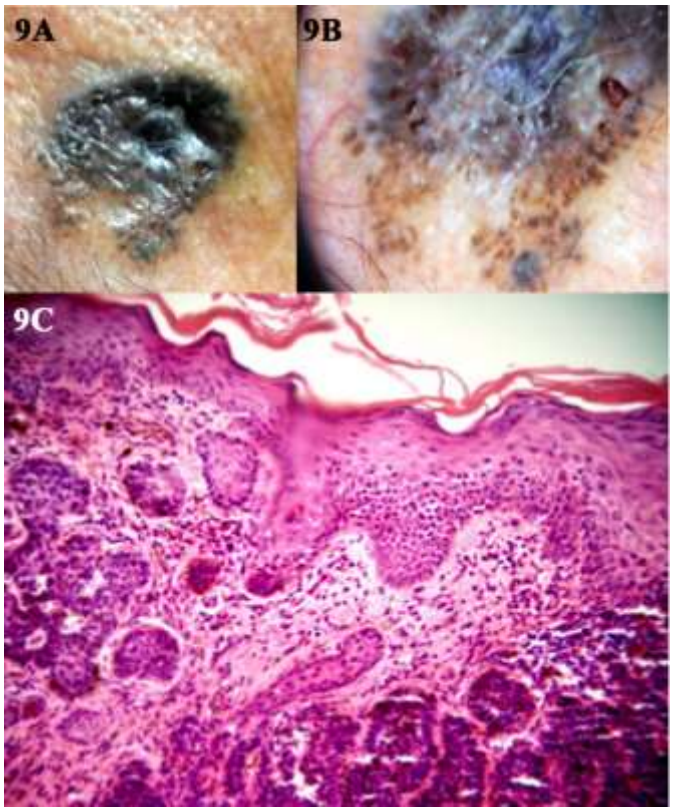

Figure 9A. Macroscopic picture of a basal cell carcinoma, nodular type, on the forehead. **9B**. Dermoscopy showed microulceration, arborizing vessels, and blue-gray blotches. **9C.** The histopathologic picture showed large irregular lobules of basaloid cells with peripheral palisading in the dermis with artefactual clefting.

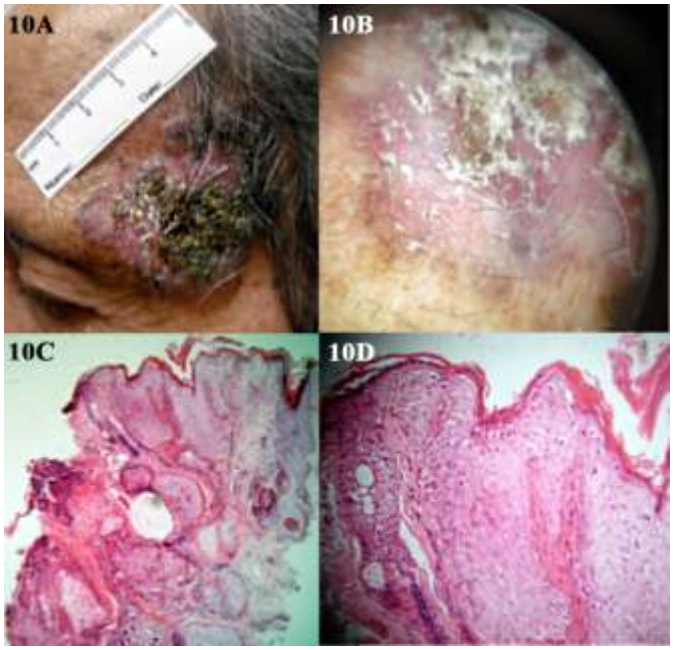

Figure 9A. Macroscopic picture of a basal cell carcinoma, nodular type, on the forehead. **9B**. Dermoscopy showed microulceration, arborizing vessels, and blue-gray blotches. **9C.** The histopathologic picture showed large irregular lobules of basaloid cells with peripheral palisading in the dermis with artefactual clefting.

Conclusion

In summary, the results of this study show that the use of a dermoscope is an essential tool for dermatologists. It aids the classification of benign and malignant lesions. It also gives a more accurate diagnosis of melanocytic and non-melanocytic lesions compared to clinical diagnosis alone. It is comparable to histopathologic diagnosis as shown in the kappa and concordance analysis. This will decrease unnecessary surgical procedures for benign lesions. More importantly, early detection of malignant lesions will result in appropriate and prompt management of malignant lesions.

REFERENCES

1. Rigel DS, Carucci JA. Malignant melanoma: prevention, early detection, and treatment in the 21st century. CA Cancer J Clin. 2000; 50:215-36.
2. Skin Cancer Statistics. U.S. Cancer Statistics Working Group. United States Cancer Statistics: 1999–2010 Incidence and Mortality Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2013. Available at: http://www.cdc.gov/uscs.
3. Braun RP, French LE, Saurat JH. Dermoscopy of pigmented lesions: a valuable tool in the diagnosis of melanoa. Swiss Med Wkly. 2004;134:83-90.
4. Alam M. Ratner D. Cutaneous Squamous-Cell Carcinoma. N Engl J Med. 2001;344:975-983.
5. Vargo N. Basal Cell and squamous cell carcinoma. Semi Oncol Nurs. 2003 Feb;19(1):12-21.
6. Carruci J, Leffell D. (2008). Basal Cell Carcinoma In K Wolff, L Goldsmith, S Kats, B Gilchrist, A Paller, D Leffell (Eds), Fitzpatrick's Dermatology in General Medicine 7th edition (pp. 1036-1042) New York,NY:McGraw Hill.
7. Rigel DS. Malignant melanoma: perspectives on incidence and its effects on awareness, diagnosis, and treatment. CA Cancer J Clin. 1996;46:195-8.
8. Braun R, Rabinovitz H, Oliviero M, Kopf A, Saurat J. Dermoscopy of pigmented skin lesions. J Am Acad Dermatol. 2005;52:109-21.
9. Prieto VG, Argenyi ZB, Barnhill RL, et al. Are en face frozen sections accurate for diagnosing margin status in melanocytic lesions?. Am J Clin Pathol. 2003; 120:203-208.
10. Crotty KA, Menzies SW. Dermoscopy and its role in diagnosing melanocytic lesions: a guide for pathologists. Pathology. 2004 Oct;36(5): 470-7.
11. Ahmadabad RN, Ghaninezhad H, Moslehi H, Azizahari S, Kamyab K, Nikoo A. Description of some dermatoscopic features of acral pigmented lesions in Iranian patients: a preliminary study. Acta Med Iranica. 2011:49(7): 472-477.
12. Argenziano G, Zalaudek I. Dermoscopy: a new perspective. Dermatol Pract Concept. 2011;1(1):12.
13. Blum A, Metzler G, Hofmann-Wellenhof R, Soyer HP, Garbe C, Bauer J. Correlation between dermoscopy and histopathology in pigmented and non-pigmented skin tumours. Hautarzt. 2003 Mar; 54(3): 279-291.
14. Vano-Galvan S, de las Heras E, Aguayo-Leyva I. Dermatoscopy for in vivo diagnosis of malignant melanoma. Aust Fam Physician. 2009 June; 38(6):420-421.
15. Pehamberger H, Binder M, Steiner A, Wolff K. In vivo epiluminescence microscopy: improvement of early diagnosis of melanoma. J Invest Dermatol. 1993 Mar;100(3):356S-362S.
16. Caluya B, Carpio B, Morales E, Tiongco I, Tanglao-De Guzman A, Yason M. Teledermoscopy for the diagnosis of malignant pigmented lesions on Filipino Skin: A cross sectional study. Presented in: Philippines Dermatological Society Research Forum. 2012.
17. Ferrara G, Argenziano G, Soyer HP, Corona R, Sera F, Brunetti B. Dermoscopic and Histopathologic Diagnosis of Equivocal Melanocytic Skin Lesions An Interdisciplinary Study on 107 Cases. Cancer. 2002;95(5):1094-1100.
18. Sim J, Wright CC. The kappa statistic in reliability studies: use, interpretation, and sample size requirements. Phys Ther. 2005;85:257-268.
19. Argenziano G, Soyer HP. Dermoscopy of pigmented skin lesions – a valuable tool for early diagnosis of melanoma. Lancet Oncol. 2001;2:443–9.
20. Marghoob A. (2012). Congenital melanocytic nevi In Marghoob A, Malvehy J, Braun R (Eds), Atlas of Dermoscopy 2nd edition (pp. 147-158) London,UK; Informa Healthcare.
21. Martin, J, Bella-Navarroa R, Jordáab E. Vascular Patterns in Dermoscopy. Actas Dermosifiliogr. 2012;103(5):357-75.
22. Braun RP, Rabinovitz H, Krischer J, Kreusch J, Oliviero M, Naldi L, Kopf A, Saurat J. Dermoscopy of Pigmented Seborrheic Keratosis: A Morphological Study. Arch Dermatol. 2002;138(12):1556-1560.
23. Ahlgrimm-Siess V, Cao T, Oliviero M, Hofmann-Wellenhof R, Rabinovitz H, Scope A. The Vasculature of Nonmelanocytic Skin Tumors in Reflectance Confocal Microscopy, II: Vascular Features of Seborrheic Keratosis. Arch Dermatol. 2010;146(6):694-695.
24. Trigoni A, Lazaridou E, Apalla Z, Vakirlis E, Chrysomallis F, Varytimiadis D, Ioannides D. Dermoscopic features in the diagnosis of different types of basal cell carcinoma: a prospective analysis. Hippokratia. 2012 Jan-Mar;16(1): 29–34.
25. Zalaudek I, Giacomel J, Schmid K, Bondino S, Rosendahl C, Cavicchini S, Tourlaki A, Gasparini S, Bourne P, Keir J, Kittler H, Eibenschutz L, Catrical C, Argenziano G. Dermatoscopy of facial actinic keratosis, intraepidermal carcinoma, and invasive squamous cell carcinoma: A progression model. J Am Acad Dermatol. 2012;66:589-97.
26. Kittler, Harald, et al. "Standardization of Terminology in Dermoscopy/Dermatoscopy: Results of the Third Consensus Conference of the International Society of Dermoscopy." Journal of the American Academy of Dermatology, vol. 74, no. 6, 2016, pp. 1093–1106., doi:10.1016/j.jaad.2015.12.038.