

Clinical and Dermoscopic Features of Skin Cancer at Sanglah General Hospital, Denpasar, Indonesia: A Case Series Study

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Abstract

Background: Dermoscopy or epiluminescence microscopy (ELM) is a non-invasive clinical examination technique of pigmented skin lesions and early stage skin cancers. **Methods:** This was a retrospective study of patients with skin cancer at dermatology outpatient clinic of Sanglah Hospital from January 2013 to December 2014. These patients were firstly assessed with unaided eye before underwent a dermoscopic examination. All diagnoses were confirmed with a histopathology examination. **Results:** There were 22 patients with skin cancer who enrolled in this study. The study participants were predominantly women (59.1%), age over 50 years (72.7%), working outdoor (90.9%), with the predominantly predominant site being on the face (96%). There were 7 patients (31.8%) with malignant melanoma and the predominant dermoscopic features were: atypical pigment network (71.4%), blue whitish veil (57.1%) and irregular streaks (57.1%). There were 10 patients (45.5%) with basal cell carcinoma, with the predominant dermoscopic feature being the arborizing vessel (60%) and ulceration (70%). There were 5 squamous cell carcinoma patients (22.7%) and the predominant dermoscopic features observed were keratin (80%) and hairpin vessels (100%). The histopathological examination results were in accordance with the description of dermoscopy features. **Conclusions:** Dermoscopy is a non-invasive tool for diagnosis of early skin cancer prior to performing a biopsy for histopathologic examination.

Keywords: *Dermoscopy, Non-invasive Methods, Skin cancer.*

Introduction

Dermoscopy or epiluminescence microscopy (ELM) is a non-invasive clinical examination technique which has been developed to improve the diagnostic accuracy of pigmented skin lesions and early skin cancer [1]. The gold standard in diagnosing skin cancer is histopathology examination, but it is an invasive procedure and a longer time is needed in order to obtain the result. Dermoscopy is a fast and non-invasive procedure, which can be used to improve the diagnostic accuracy of pigmented skin lesions and skin cancer. While dermoscopy can not replace the role of histopathology, it is a promising additional diagnostic instrument in dermatology [2, 3].

Skin surface microscopy was first developed in 1663 by Kolhaus and Goldman was the first dermatologist who introduces the term dermoscopy or dermatoscopy for evaluation

of pigmented skin lesions [1]. Argenziano et al stated that dermoscopy can improve the accuracy of clinical diagnosis of pigmented lesions which are clinically unclear, thus promote the usage of it for the clinicians [2]. At first, dermoscopy was used only for examination of pigmented lesions and since that a lot of algorithms had been introduced to increase the accuracy of diagnosing melanoma, such as the 7-points rules, 3-points checklists, ABCD rule, Menzies method, and others. Nowadays, this technique can help diagnosing other skin diseases such as psoriasis, scabies, and hair disorders [4].

In 2001, the first polarized dermatoscope with polarised illumination, coupled with a cross-polarised viewer was introduced. It reduces (polarises) the reflection of the skin surface, thus allowing visualisation of skin

structures without using any immersion fluid. Examination of several lesions is thus more convenient because physicians no longer have to stop and apply fluid to the skin before examining each lesion, resulting in dermoscopy to gain popularity among physicians worldwide. Recently this tool is widely available and it comes from a lot of manufacturers; from Braun-Falco, Bilek and Stolz (Heine Heine Delta 10 or Delta 10 plus) [4, 5].

Dermoscopy is a promising fast and non-invasive procedure, that can improve the diagnosis of skin lesions. A lot of dermoscopic features have been reported to be associated with certain type of skin lesions. In this study, we reported dermoscopic features found upon skin cancer cases in Sanglah Hospital, Bali, Indonesia.

Methods

This was a retrospective study. Study participants were patients with skin cancer, which consisted of malignant melanoma (MM), basal cell carcinoma (BCC) and squamous cell carcinoma (SCC), who had been undergoing periodic dermoscopic examinations at the dermatology outpatient clinic of the Sanglah General Hospital in Denpasar, Bali, Indonesia.

This study was conducted from January 2013 to December 2014. Patients' data about the clinical characteristics (age, sex, site, and height), histological characteristics (clinical type, regression, ulcerations, and nevus), and dermoscopic characteristics of the melanomas were collected were obtained from the medical record. A written consent was obtained from each study participants and this study has been approved by the ethics committee of Sanglah Hospital and Udayana University.

The patients' skin lesions were firstly assessed with the unaided eye, to identify the clinical features of skin cancer. Subsequently, the patients then underwent dermoscopy examination, to identify the certain dermoscopic features. All skin cancer diagnoses have been confirmed with a histopathology examination.

The preoperative diagnosis was based on clinical criteria (ABCD rule) and dermoscopy criteria. In this study, we used the DermLite foto system (magnification $\times 10$) and evaluated the global and local dermoscopic features as defined by the virtual consensus meeting [6].

Results

Twenty-two patients with skin cancer attended the dermatology outpatient clinic at Sanglah General Hospital; consisted of 7 patients with MM, 10 patients with BCC, and 5 patients with SCC. They were found predominantly in women (59.1%), age over 50 years (72.7%), and Fitzpatrick skin types II-IV (77.3%). It is also mostly likely to be found in those who working outdoor (90.9%), while the location is predominantly on the face (96%).

Examination of patients with MM revealed this following dermoscopic features: atypical pigment network (71.4%), blue whitish veil (57.1%), irregular streaks (57.1%), and irregular dots/globules (57.1%). In BCC cases, the dermoscopic features observed were arborizing vessel (60%), ulceration (70%), and telangiectasia (28%). In SCC patients these following dermoscopic features were observed: keratin (80%) and hairpin vessels (100%). The histopathological examination results were in accordance with the description of dermoscopy features.

Table 1: Characteristic of cases

	Basalioma 10 (45.5 %)	Melanoma 7 (31.8 %)	SCC 5 (22.7 %)	
Sex				
Male	6	1	2	9 (40.9%)
Female	4	6	3	13 (59.1 %)
Age				
< 50 year	2	3	1	6 (27.3%)
> 50 year	8	4	4	16 (72.7%)
Skin type				
I-II	2	-	3	5 (22.7 %)
III-IV	8	7	2	17 (77.3 %)

V-VI	-	-	-	-
Work				
Outdoor (Sun exposures)	8	5	4	19 (86.4%)
Indoor	2	2	1	3 (14.6%)
Location				
Face	9	6	5	20 (90.9%)
Body	1	1	-	2 (9.1%)

Discussion

Melanoma Maligna (MM)

Melanoma maligna is the most dangerous form of skin cancer, these cancerous lesions most often caused by ultraviolet radiation from the sunshine or tanning beds, triggers mutations (genetic defects) that cause the skin cells to multiply rapidly and form malignant tumors. These tumors originate in the pigment-producing melanocytes in the basal layer of the epidermis [5]. Melanomas often resemble moles; some develop from moles or melanocytic nevus.

Moles suspicious for melanoma usually show one or more of the following symptoms and signs (the ABCDs): asymmetry, border irregularity, color changes or too many colors in one mole, and diameter more than 6mm. These features are best observed with dermoscopy. Dermoscopic features suggesting malignancy in melanomas are atypical pigmented network, thick lines reticular, grey dots, black dots, peripheral, polymorphous vessels, parallel ridge pattern [7].

Dermoscopic features observed in this case series were atypical pigmented network (71.4%), blue-whitish veil (57.1%), and atypical vascular pattern (75%). These features are in accordance with the major criteria of 7-point melanoma checklist. While features such as irregular streaks (57.1%), irregular pigmentation (75%), irregular dots/globules (57.1%), regression structures (50%), are in accordance with the minor criteria. These following findings were also observed: ulceration/bleeding (50%), featureless area (50%), telangiectasia (50%), milia-like cyst (25%), and arborizing vessels (25%).

Another study reported that 55.5% to 57% melanoma cases showed an atypical pigment network [8,9]. A study reported that this finding is observed in 82.4% of superficial spreading melanoma cases and in 20% of nodular melanoma cases [8]. This pigment

network is actually a mesh of brown or black lines and it is consistent with melanocyte hyperplasia of the rete ridges [8]. This atypical pigment network can also be found in a melanocytic nevus. In melanoma, the network is thicker and more irregular and often finishes abruptly [8].

The blue-whitish veil is an area of grayish pigmentation with a ground glass appearance and it is consistent with melanoma, although it has been reported to be observed in basal cell carcinoma or another non-melanocytic lesion [8]. Histologically, it is an aggregate of pigmented cell in the dermis, combined with hyperorthokeratosis [8]. Previous studies reported that this finding was observed in 42% to 58% of melanoma cases, similar to the finding in this series (57.1%) [8, 9].

Vascularization is an important dermoscopy finding. A number of melanoma-specific vascular patterns have been reported. In this case series, the atypical vascular pattern was observed in 75% of the cases. The vascular pattern has more values in identifying hypomelanotic melanomas because sometimes it is the only variable can be observed by dermoscopy [7].

In melanoma without a specific dermoscopic pattern, abnormal vessels and traces of melanic pigment could be revealing details. Arborizing vessel is uncommon findings in melanoma, where in a study one false positive case was observed, with dermatoscopic findings of arboriform vessels, but histopathologic examination was consistent with an

intradermal melanocytic nevus associated with sebaceous hyperplasia in a lesion located in the nose [10].

Other findings such as irregular streaks, irregular pigmentation, irregular dots/globule, regression structures, are

characteristics for melanoma [8,9]. Irregular streaks are linear structures which not connected with the network lines and distributed irregularly at the edge of the lesion [8].

Histologically, this is melanocytic nests that are parallel to the surface. Irregular dots/globules are irregularly distributed black or brown oval structures with various sizes. The regression structures (blue-gray dots and/or starburst scarring) can be observed at the flattest part of the lesion, which appears as scar-type white depigmentation and/or blue peppered dots [8].

This finding can be observed in benign or malignant melanocytic and nonmelanocytic lesions; however, in melanocytic lesions, it is suggestive of melanoma [8]. Regression is an important confounder in histology of pigmented lesions; thus if identified in dermoscopy, it should be reported to the pathologist [8]. All these findings help to differentiate the malignant melanocytic lesions from benign melanocytic lesions and non-melanocytic lesions.

Basal Cell Carcinoma (Basalioma)

Basalioma is an abnormal, uncontrolled growths or lesions that arise in the skin's basal cells, which line the deepest layer of the epidermis (the outermost layer of the skin). Basal cell carcinomas often look like open sores, red patches, pink growths, shiny bumps, or scars and are usually caused by a combination of cumulative and intense, occasional sun exposure [11].

Basalioma rarely metastasizes beyond the original tumor site, but it is invasive and destructive to tissue surrounding area and it is especially common on the face, often forming on the nose. It is possible to get BCC on any part of the body, including the trunk, legs, and arms [11, 12].

There are specific dermoscopic features that can be used to confirm the diagnosis of BCC, such as: absence of pigment network, linear and arborising (branch-like) telangiectasia, structureless or leaf-like areas on the periphery of the lesion, large blue-grey ovoid nests or blotches, multiple blue-grey globules, specks of brown and grey pigment, spoke wheel areas (radial projections from a

well circumscribed dark central hub), ulceration [12]. Dermoscopy improves the clinical diagnosis of BCC, allowing its detection at an early stage and also acts as a valuable method in differentiating BCC from the other skin tumors and diseases.

In this study, the percentage of the dermoscopic features of the 10 basalioma cases were: ulcerative pattern (70%), multiple blue-gray globules (27.3%), maple leaf like area (27.3%), large blue/gray ovoid nest (27.3%), spoke wheel area (18.2%), telangiectasia (63.6%) and arborizing vessel (60%). The others dermoscopic finding are featureless area (18.2%), milia like cyst (18.2%), scale (18.2%), comma vessel (18.2%), coiled vessel (9.1%) and white structureless zone (9.1%).

The Vascular structure is important findings in dermoscopy examination in BCCs, with arborising and kinking vessels being the most common. Other findings include large diameter vessels, thin pruning vessels, hairpin like vessels, and pinpoint vessels [13]. In this study, arborizing vessels were observed in 60% of the cases. Studies have reported that arborizing vessels were observed in 78-82.1% of the cases; a similar finding when compared with this study [13, 14].

Another study found even higher percentage, up to 95% of the examined BCCs [10]. Arborizing vessels are dilated vessels in the dermis, which is a sign of the supportive neovasculture of the tumor tissue. Arborizing vessels appear as bright red colored stem vessel of large diameter, branching irregularly into finest terminal capillaries, which is perfectly in focus due to their location on the surface of the tumor [13]. Arborizing vessels also can be used to identify the tumor border, thus it is an important factor in the surgical planning and control of these tumors, for it contributes to identify the clinically obscure borders of the tumors [10]. Arborizing vessel is an important diagnostic finding in all form of BCCs, except for superficial pigmented BCC [13].

Maple leaf-like areas are translucent brown to gray/blue peripheral bulbous extensions that never arise from pigmented network or

from adjacent confluent pigmented areas which are actually tumor nests that contain pigment aggregates and it is connected to each other by lobular extensions [13].

This finding is highly specific for the diagnosis of BCC, especially superficial BCC. This study found that maple leaf-like area was observed in 27.1% of the cases, similar to another study which reported it to be 24.2% with following descriptions: 50% of pigmented, 37.5% of metatypic, and 25% of solid BCCs [14].

Under the dermoscopy, ulceration appears as one or more large structureless area of red to black-red color. While by the unaided eye, it appears as an area without the epidermis, usually covered by hematogeneous crusts [14].

Ulceration is a common finding in nodular, morpheaform, and infiltrative BCCs, also in basosquamous carcinoma and it is a less common finding in superficial, solid, and pigmented BCCs [13, 14]. In this study, ulceration was observed in 63.6% of the cases, higher when compared to another study (44%) [14]. This finding might be due to different subtypes of the BCCs that were examined.

Both blue-gray ovoid nests and multiple blue-gray globules represent tumor nest with pigment aggregates. The ovoid nests are larger in size and also invade the dermis, while the globules are localized in the papillary and/or reticular dermis [13].

Under the dermoscopy they appear as well circumscribed, confluent or near confluent pigmented ovoid or elongated configurations and it is not intimately connected to pigmented tumor body, with blue-ovoid nests being larger than blue-gray globules [13]. In this study, blue-grey ovoid nests and multiple blue-grey globules have the same percentage (27.3%). As a comparison, a study reported the percentage of blue-grey ovoid nests and multiple blue-grey globules to 9.7% and 18.5%, respectively [14].

Another important finding is spoke wheel areas, which are actually tumor nests arising and connected to the epidermis and it is characterized by finger-like projections

with centrally located pigment. It appears as well-circumscribed radial projection, usually tan (can be blue or gray), ended on an axis which often has darker color [13]. In this study, this feature was observed in 18.2% of all BCC, which is higher when compared to previous studies (5.6-6%) [14]. Spoke wheel areas are more common in superficial pigmented and nodular pigmented BCCs, thus might explain the differences, since the study examined different types of BCCs.

Squamous Cell Carcinoma

Squamous cell carcinoma (SCC) is the second most common form of skin cancer and frequently arises on the sun-exposed skin of the middle aged and elderly. SCC is much more common in areas with a high sun exposure. Larger, more aggressive lesions may require aggressive surgical management and/or radiation therapy.

High-risk SCC has a considerable metastatic rate and requires careful evaluation and treatment [16, 17]. Squamous cell carcinoma is a malignant tumor of keratinocytes. Most SCCs arise from sun-induced precancerous lesions known as actinic keratoses. SCC is capable of local extension, regional lymph node metastasis, and distant metastasis.

Squamous cell carcinoma has various dermoscopic features, depending on the degree of differentiation and the tumor site. Dermoscopic features have been described for two superficial forms of SCCs; intraepithelial carcinoma (pigmented and non-pigmented Bowen disease) and actinic keratosis.

The features present as ulceration which may or may not be prominent (severely ulcerated tumors are impossible to differentiate and may have no visible dermoscopic structures), keratin crust/scale, white structureless areas, hairpin vessels with irregular round, coiled, looped, serpentine, branched or polymorphic morphology. Greater variation in the vasculature is associated with less differentiation histopathologically [17, 18]. In this study, the most common dermoscopic features of SCC were central keratin (80%), white structureless zone (60%), white circles (60%), coiled vessel (60%), blood spot (40%), and bloody and ulceration (20%).

In this study, central keratin was found in 80% of SCC cases. Central mass of keratin is an architectural criterion for the diagnosis of keratoacanthoma (invasive cutaneous SCC) on histopathologic analysis, thus the finding in this study is not surprising [3].

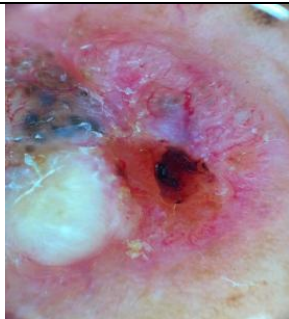
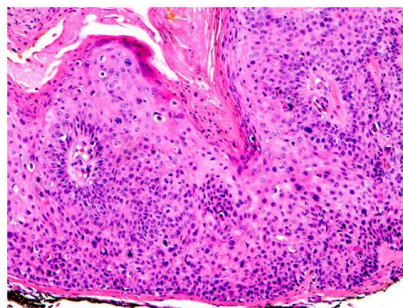
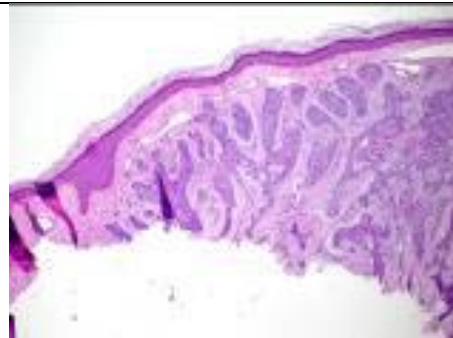
Dermoscopic features of keratins are the most useful features in differentiating SCC from the other skin lesions. A retrospective study reported that central keratin was found in 51.2-88% keratoacanthoma cases, 30.0% of SCC cases, and 32% of nodular SCC cases [19].

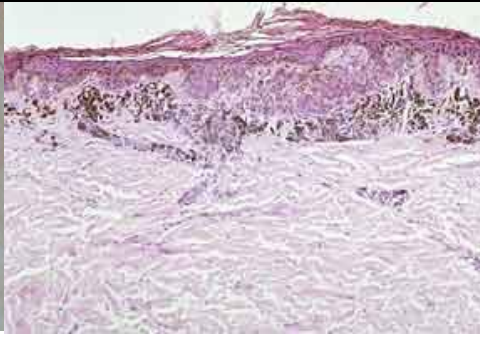
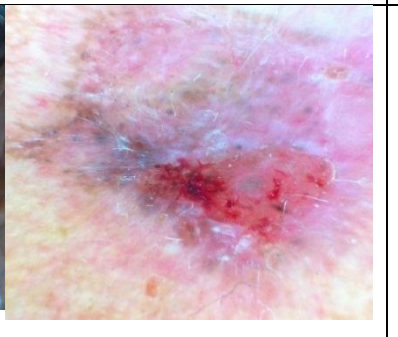
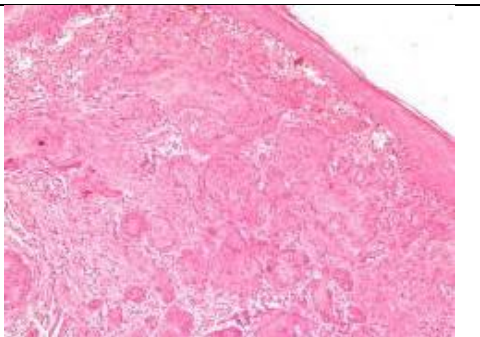
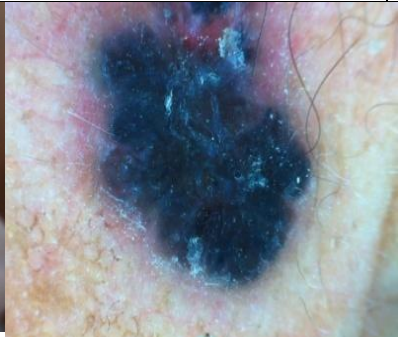
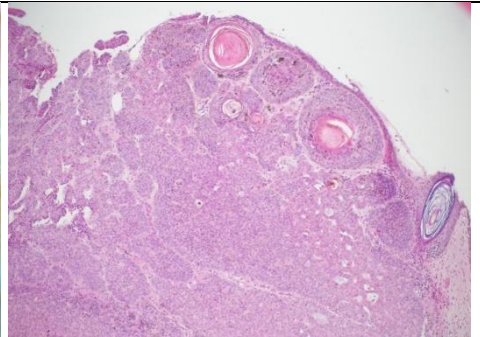
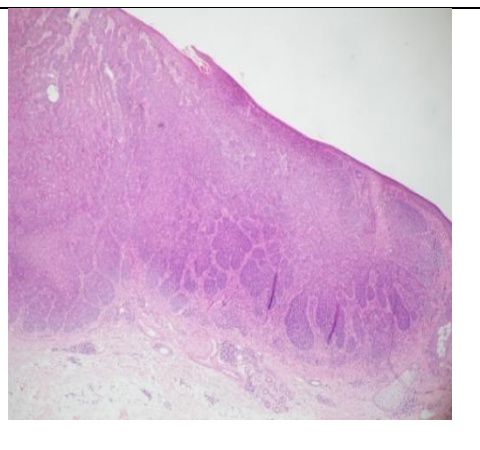
The White structureless zone was found in 60% of all cases. When compare to another study, the white structureless zone was reported to be found in 40-66% of SCCs and 50-55.8% of keratoacanthoma [19].

White circles is an important dermoscopic

findings in SCC. White circles have been reported to have the highest specificity (87%) for keratoacanthoma [19]. The previous study reported that this feature was observed in 41-60% SCC cases (32% for nodular SCC) and in 25.6-41.6% keratoacanthoma cases [19]. While in this study, this feature was observed in 60% cases.

In the diagnosis of non-pigmented nodules, vascular features are important findings. Coiled vessel (glomerular) (60%) was the prominent finding of this series. This vessel type is often found in other keratinizing lesions, including actinic keratosis and Bowen's disease. However, invasive SCCs and KAs developed a more polymorphic vascular pattern with an increased frequency of hairpin and linear irregular vessels [3].

Clinical features	dermoscopic	Histopathologic
		
1a. SCC	1b. Ulcer, Aborizing vessel, Keratin	1c.
		
2a. SCC	2b.	2c.

		
3a. Basalioma	3b.	3c.
		
4a. Basalioma	4b.	4c.
		
5a. Basalioma	5b.	5c.
		
6a. Basalioma	6b.	6c.

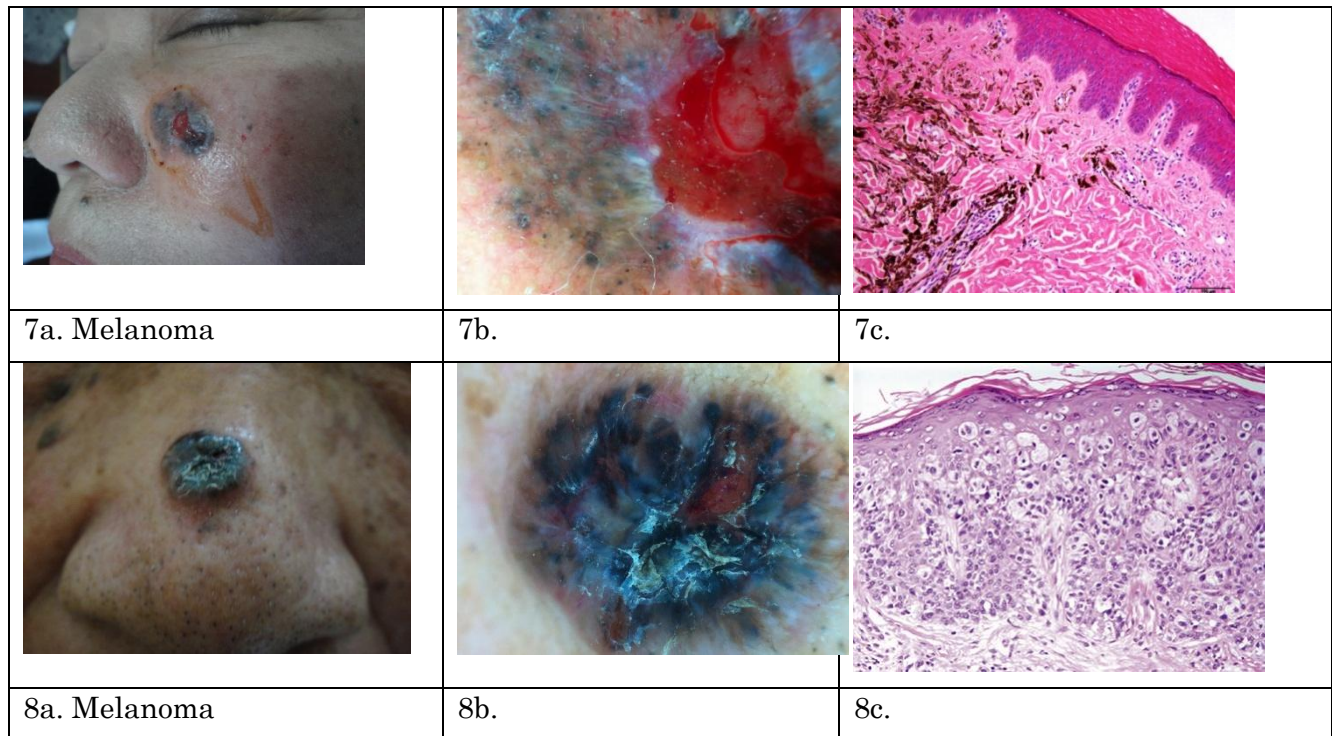


Figure 1: Clinical features, Dermoscopic and Histopathological finding

Table 2: Dermoscopic features observed in the skin cancer

Dermoscopic features	Basalioma 10 (45.5 %)	Melanoma 7 (31.8 %)	SCC 5 (22.5 %)
Pigment			
Asymmetry & Atypical pigment network	-	5	-
Blue-white structures	-	4	-
Irregular streaks	-	4	-
Irregular dots/globules	4		
Regression structures	1	8	-
Vascular			
Arborizing vessels	6		-
Hairpin vessels	4	1	5
Blood spots	2	3	-
Others			
Blood or ulceration	7	-	-
Keratin/central keratin	-	-	4
Teleangiectasia	-	-	-

Conclusion

This brief series showed that dermoscopy might be a promising non-invasive yet fast technique to improve the diagnosis of malignant skin lesions. The dermoscopic

features reported in this series were consistent with the consensus and findings from another series. Minor differences might be due to various samples used in different studies.

Although dermoscopy cannot take the place of histopathology examination in diagnosing malignant skin lesions, dermoscopy can be used as a routine examination for early detection prior to histopathology examination.

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Conflict of Interest

The authors declare no conflict of interest in this study.