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Accuracy of Dermatoscopy in the Diagnosis of Basal Cell Carcinoma on the Skin of Head and Neck

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Abstract

Background and objectives: Basal cell carcinoma is the commonest malignancy among all malignancies of the body. Sun exposure plays an important role in its pathogenesis. Basal cell carcinoma usually is localized and meta rarely. Dermatoscopy is a new non-invasive surface microscopic examination of the skin. It is proved to play significant role in the early diagnosis of BCC. The aim of the study is to evaluate dermatoscopic features of basal cell carcinoma lesions. **Methods:** One hundred and seventy lesions on the head and neck of patients were suspected for BCC dermatoscopically and included in the study. Biopsies of the lesions sent 140 for histopathological confirmation. Dermatoscopic pictures of each lesion saved as picture through a camera adapted to the dermatoscope. Data and dermatoscopic picture evaluated and analyzed statistically. **Results:** Diagnosis of basal cell carcinoma was confirmed for 163 lesions out of 134 patients with head and neck BCC lesions. Majority of patients had photo type III (75.3%). Most common clinical type was ulcerative (74 lesions, 45.4%). Pigmented lesions where 107 (65.6%) basal cell carcinoma lesions. Sensitivity of dermatoscopic diagnosis of BCC was 95.8%. Eight dermatoscopic features were observed in the lesions. Most common dermatoscopic finding was vascular (126, 77, 3%) and most common vascular feature was arborizing blood vessels. **Conclusions:** Dermatoscopy is a useful noninvasive visual aid in the diagnosis of basal cell carcinoma and its sensitivity is usually above 95%. Histopathology of basal cell carcinoma may remain in the future as tool for control of its treatment only.

Keywords: Basal cell carcinoma; Dermatoscopy; Dermatoscopic features

Introduction

Basal cell carcinoma (BCC) is the commonest malignancy among all malignancies of the body all over the world with the most high incidence rate in the subequatorial and equatorial countries. Ultraviolet radiation from sun exposure intermittently plays as an important etiological factor in its pathogenesis[1]. Face as an exposed part of the body is the predilection site to develop this type of skin cancer. Other known risk factors for BCC are fair skin, skin burn by sun and subjection to ionizing radiation[2]. This carcinoma usually does not metastasize but sometimes if neglected by the patient it can distract the skin and invade underlying structures like bone. Its growth in size can make the lesion inoperable especially on the face[3]. Dermatoscopy is non-invasive real time microscopic examination of the skin. It is proved to be very important in early diagnosis of malignancies of the skin including melanoma and BCC. This method of the earlier diagnoses improves early removal with better prognosis[4]. Many dermatoscopic finding are confined to the diagnosis of BCC. Usually in one lesion all dermatoscopic features cannot be found. For the diagnosis of pigmented BCC by dermatoscope, it is crucial to exclude presence of pigmented network and there should be one of the following dermatoscopic features: ulceration (not associated with a recent history of trauma), multiple blue/gray globules, leaf-like areas, large blue/gray ovoid nests, spoke-wheel areas, and arborizing telangiectasia[5,6]. Specificity of the skin of the face and its difference from the skin of rest parts of the body reflects the dermatoscopic pictures. Presence of the hair follicle in network like pattern is regarded to be normal in the face during dermatoscopic examination[7]. The aim of our study is to evaluate accuracy of dermatoscopy in the diagnosis of BCC lesion on the head and neck.

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Patients and Methods

This is a cross sectional study. The data were collected from August 2017 to June 2018. One hundred and seventy lesions on the head and neck of 140 patients were suspected for BCC dermatoscopically. These patients were among those who attended outpatient department of "Erbil Dermatology Teaching Center" seeking medical help. The lesions diagnosed first clinically by two dermatologists then been evaluated by dermatoscope, after that excisional biopsies of these lesions were sent for histopathological study to confirm the diagnosis of BCC. We used in our study Dermatoscope Heine Delta 20 adapted to a SLR Canon EOS 700 camera. Dermatoscopic pictures for each lesion were saved for later on evaluation and study. Lesions were divided to clinical subtypes (Nodular, ulcerated, superficial Infiltrative and Morpheaform). Also they were classified for being pigmented BCC (pBCC) or non-pigmented BCC (npBCC). After the confirmation of the diagnosis of BCC by histopathology, the dermatoscopic pictures were analyzed for their features in each lesion. Then all data analyzed through software program SPSS version 22. The study was approved ethically from college of medicine, Hawler medical university.

Results

Hundred forty patients were taken in this study with 170 cutaneous lesions on the head and neck skin. The diagnosis dermatoscopically suspected for BCC. Lesions operated on as an excisional biopsy and the specimens were sent for the histopatholgoical study. Among these the diagnosis of BCC confirmed for 163 lesions out of 134 patients with head and neck BCC lesions, 83 were males and 51 were females. Their ages ranged between 35 to 87 years, with a mean of 68.3±15.5. Sixty three (47%) patients were resident at rural areas and 71 (53%) patients were residents of city. 83 (61.9%) of them previously worked as farmers. Smoking was predominant habit among them, in 93 (69.4%) patients. Family history for skin cancers was positive only in 14 (10.4%) patients, Table 1.

Table (1): Socio-demographic characteristics of the patients of study.

Parameter		No.	%
Sex	Male	83	61.9
	Female	51	38.1
Age (mean±SD) years		68.3±15.5	
Residency	Inside the city	71	52.9
	Rural areas	63	47.1
Previous work (past 20 years)	Government officer	34	25.4
	Private work	8	6.0
	Farmer	83	61.9
	None	9	6.7
Smoking history	Smoker	93	69.4
	Non smoker	41	30.6
Family history of skin cancer		14	10.4%

The patients' phototype according to Fitzpatricks classification was mainly type III, 101 (75.3%) patients. Skin phototype II was observed in 19 (14.3%) patients, skin phototype IV in 12 (8.9%) patients and only 2 (1.5%) patients were of skin phototype I. Figure 1.

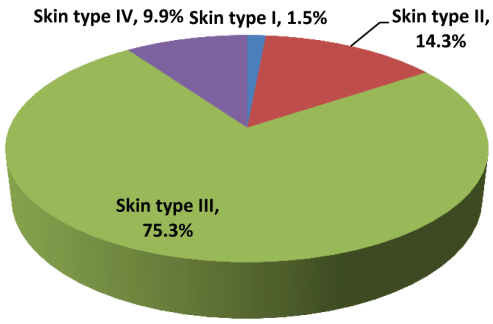

Figure (1): Distribution of the skin phototypes in our patients

The BCC tumors were classified according to their clinical types. The most frequent type found was the ulcerated variant which found in 74 (45.4%) lesions. Morpheaform was the least common one as it was only in 7 (4.3%) lesions. The BCC were generally and for each type clinically subdivided in to pigmented BCC (pBCC) and non-pigmented BCC (npBCC) which their proportions were 65.5% and 34.4% respectively, Table 2.

Table (2): Clinical types of BCC and their sub-classification of pigmentation

Clinical Type	N/%	pBCC	npBCC
Nodular	59 (36.2%)	38 (64.4%)	21 (35.6%)
Ulcerated	74 (45.4%)	48 (64.5%)	26 (35.5%)
Superficial spreading	13 (7.9%)	9 (69.2%)	4 (30.8%)
Infiltrative	10 (6.2%)	8 (80.0%)	2 (20.0%)
Morpheaform	7 (4.3%)	4 (57.1%)	3 (42.9%)
Total	163 (100%)	107 (65.6%)	56 (34.4%)

The Duration of the skin lesion was ranging from 5 months to 4 years, mean was 11±2.1 months. Patient during the presentation were complaining of following signs and symptoms, bleeding from the tumor was positive in 92 (68.6%) patients, itching was observed only in 12 (8.9%) patients and ulceration was present in 94 (57.6%) lesions. Finding of the dermatoscopic features of the BCC lesions on the head and neck of our patients were recorded for each patient and were collectively analyzed. The most frequent dermatoscopic feature was blood vessels features which were positive in 126 (77.3%) lesions. The other dermatoscopic findings were ulceration, leaf-like pigmentations, white structureless areas, micro-abrasions, blue-grey globules, dots and spoke wheel areas which their frequencies were 102 (62.5%), 98 (60.1%), 82 (50.3%), 82 (50.3), 80 (49%), 69 (42.3%), 21 (12.9%), Table 3 and Figure 2 and 3.

Table (3): requency of dermatoscopic features in the lesions of BCC

Dermatoscopic features	BCC lesions	
	No.	%
Vascular features	126	77.3
Ulceration	102	62.5
Leaf-like pigmentations	98	60.1
White structureless areas	82	50.3
Micro-abrasions	82	50.3
Blue-grey globules	80	49.0
Dots	69	42.3
Spoke wheel areas	21	12.9

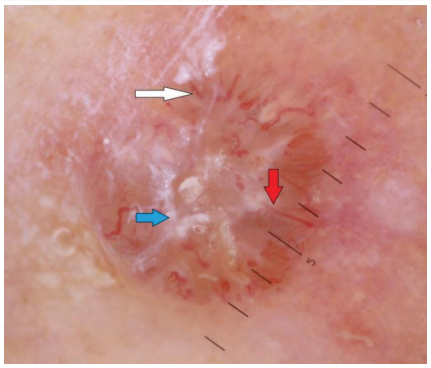

Figure (2): Dermatoscopy: Non-pigmented BCC, nodular type. White arrow: vascular feature, hairpin blood vessel. Blue arrow: White structures area.

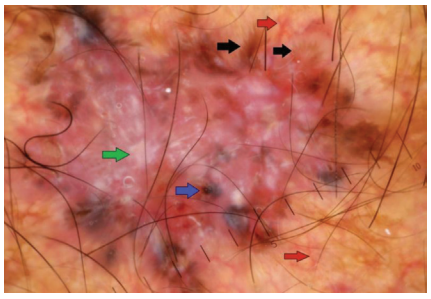

Figure (3): toscopy: pBCC, superficial spreading type. Black arrows: leaf like pigmentation. Blue arrow: pigmented globules. Green arrow: White structures area. Red arrows: vascular features.

In our study we found out that a lot of lesions of BCC showed more than 3 dermatoscopic features of BCC (67, 41.1%). Lesions showing only one dermatoscopic feature were only 29 (17.8%) lesions, Table 4.

Table (4): Frequency of presence mono or multi dermatoscopic feature in the BCC lesions

Dermatoscopic features	No	%
Only one feature	29	17.8
Two features	23	14.1
Three features	44	27.0
More than three features	67	41.1
Total	163	100
Total (%)	163 (100%)	107 (65.6%)

Dermatoscopic blood vessel features in the lesions of our study sample were variable. Arborizing blood vessels, large diameter blood vessels, hair pin blood vessels, serpentine blood vessels and hemorrhagic crust were seen. All these mentioned above blood vessels often were seen in the same BCC lesion, Figure 4.

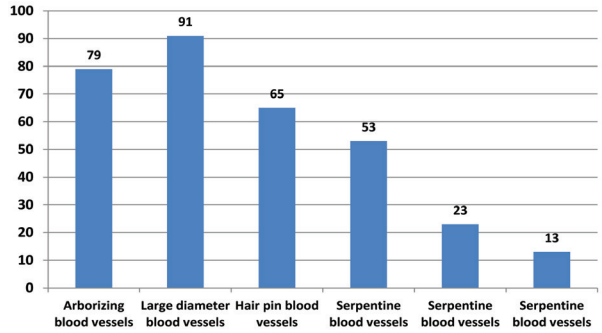

Figure (4): Frequency of Dermatoscopic vascular features of BCC lesions

Table (5): Dermatoscopic features of BCC in different clinical types of BCC.

Dermatoscopic features	Nodular n=59	Ulcerated n=74	Superficial n=13	p-value
Vascular	57 (96.6%)	49 (66.2%)	5 (38.5%)	<0.001
Leaf-like pigmentation	24 (40.6%)	39 (52.7%)	10 (76.9%)	=0.05
Ulceration	6 (10.1%)	74 (100%)	7 (53.8%)	<0.01
Micro-abrasions	17 (28.1%)	26 (35.1%)	4 (30.7%)	>0.05
Dots	14 (23.7%)	39 (52.7%)	9 (69.2%)	<0.05
Blue-grey globules	43 (72.9%)	28 (37.8%)	2 (15.4%)	<0.05
Spoke wheel areas	4 (6.7%)	11 (14.9%)	4 (30.8%)	<0.05
White structure-less areas	11 (18.6%)	53 (71.6%)	11(84.6%)	<0.05

Presence of dermatoscopic features of the BCC lesions in our study was variable from one clinical type to another. We compared most common clinical type where we found out that the nodular type is more characterized by vascularity (96.6% of the lesions) and blue-grey globules (72.9% of the lesions). Ulcerated BCC lesions showed ulceration features (100% of the lesions) and white structure-less areas (71.6% of the lesions) this is may be due to process of healing of the ulcer by fibrosis which reveals by dermatoscope as white objects. Superficial BCCs were more characterized to have white structure-less areas (84.6% of the lesions), leaf-like pigmentations (76.9% of the lesions) and dots (69.2% of the lesions), Table 5.

Discussion

In our research, the following clinical types of the BCC were found: ulcerated, nodular, superficial spreading, infiltrative and morpheaform. The commonest type was ulcerated type which seen in 74 (45.4%) of the lesions. This high proportion of ulcerated type could be due to the fear from ulcers that make the patient to seek for medical help.

In our study sensitivity of the diagnosis of BCC lesions by Dermatoscopy was 95.8%. This is nearly consistent with

other studies done by Bengü and coauthors where the sensitivity for BCC dermatoscopic diagnosis was 97%8. In other study done by Menzies and his colleagues the sensitivity of dermatoscopic diagnosis is much higher than ours (97%), this is because the study lesions were all pBCC which is usually have at least one dermatoscopic features5. As it is clear in the Meinzes criteria for the diagnoses of BCC5, which is based on absence of pigmented network and presence of one dermatoscopic features of BCC in pigmented lesions only. Pan and coauthors9 found out that the sensitivity of dermatoscopic diagnosis of BCC could be increased up to 99%, as they considered diagnosis of BCC on the base of dermatoscopy by finding four of six dermatoscopic features of BCC which were put by Meinze. In our study we found out that lot of the lesions of BCC shows more than 2 dermatoscopic features of BCC. Lesions showing more than three dermatoscopic features were 67 (41.1%) lesions of BCC. The results of our study confirms the sensitivity of the report by Pan et el for increasing the sensitivity, but in contrary many lesions of BCC will be missed (38.9%) for the diagnosis if we set the criteria to have more than three dermatoscopic features, Table 4. It is confirmed that any BCC lesion could be pigmented. Labeling BCC to be pigmented is now dependable on the presence of dots, globules, nests or other pigmented structures by dermatoscopic features10. The ratio of pBCC to npBCC is thought to be reliable on the racial difference of the skin5. In our setting pBCCs were 107 (65.6%) lesions which higher than usual proportion of pBCC, this may be due to the darker skin phtotype of our patients which were mostly type III (75.3% of the patients). Also it could be due to reliability on dermatoscope to fix lesion as pBCC rather than naked eye, which is some time cannot detect pigment in BCC lesions. During analysis of the dermatoscopic features of different clinical type, we found out that every clinical type have tendency to have one or more specific dermatoscopic features. The nodular type mostly have vascular signs (96.6% of the lesions) this may be due to exophytic tissue that expose upward the dermal blood vessels. Also the nodular BCC have predominantly blue-grey globules (72.9% of the lesions). All the ulcerated BCCs absolutely have ulcerations (100% of the lesions) on dermatoscopy. Superficial BCCs mostly have white structures-fewer areas (84.9% of the lesions) which is indication for fibrosis at the area, also this type of BCCs on pigmented variant have leaf-like pigmentations (76.9%) and dots (69.2%), Table 5.

Conclusions

Dermatoscopy is a useful real time noninvasive visual aid in the diagnosis of BCC. Its sensitivity for the diagnosis of BCC is usually higher than 95%, In the future hstopathological investigation of BCC lesions may provide only control of the treatment. The most found dermatoscopic feature is vascular (77.3%).

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