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RESEARCH ARTICLE

DERMOSCOPIC FEATURES OF SEBORRHEIC KERATOSIS AND IT'S PREVALENCE IN SULAIMANI CITY

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ABSTRACT

Background: Seborrheic keratosis is one of the common benign epidermal tumors. Although most cases of seborrheic keratosis can be diagnosed clinically, knowing the dermoscopic features of it is of paramount importance to differentiate it from other clinically similar diseases (pigmented actinic keratosis, pigmented basal cell carcinom and malignant melanoma). Objectives To describe the morphological features of Seborrheic keratosis as seen by dermoscope and to investigates their prevalence. Patients and methods A cross sectional study that enrolled 60 patients with seborrheic keratosis using macrophotography and dermoscopy for the documentation of the cases. **Results:** A total of 8 morphological dermoscopic features were identified. The most common features were milia-like cyst (73.3 %) followed by comedo-like opening (31.7 %) and well demarcation (31.7 %). **Conclusion:** Seborrheic keratosis may present with a variety of dermoscopic features. Although the classical dermoscopic features (milia-like cyst and comedo-like opening) were the commonest features of seborrheic keratosis in this study, the presence of other features like fissure and ridges, fat finger, moth eaten border and hairpin vessels increase the diagnostic accuracy of seborrheic keratosis.

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INTRODUCTION

Seborrheic Keratosis (SKs): A benign cutaneous tumor composed of epidermal keratinocytes, having multiple morphological features, mainly pigmented, on sun exposed area and more common in the elderly[1]. Almost all epidemiologic studies have noted SKs as coincidental findings. They have been reported to be more common in Caucasian populations. Their appearance prior to the fourth decadeis uncommon. Usually, lesions continue to develop throughout one's lifetime [2].Slightly more common and more extensive in males [3].

Pathogenesis: The exact pathogenesis is unknown[4]. Sun exposure has been implicated in their development. Supporting evidence comes from the more frequent occurrence and earlier age of onset of SKs in individuals residing in tropical climates. An Australian study found a higher prevalence of SKs within sun exposed areas such as the head and neck in contrast to non-sun exposed areas in the same subjects[5]. In some cases gain-of-function mutations in *FGFR3* and *PIK3CA*genes, was founded; these genes were also mutated in solar lentigo and keratinocytic epidermalnevi. This explains the think that some seborrheickeratosis begins as flat lesions that cannot be distinguished from solar lentigines [4]. Aging remains the strong factor in the development of SKs [6].

Clinical features: Although occasionally solitary, SKs more commonly present as multiple, pigmented, sharply marginated lesions. They may be macules, papules or even plaques, depending on their stage of development. Even within the same lesion there may be a marked variationin color. They are usually light brown but may appear white to waxy yellow to brown–black in color. SKs typically evolve from a macule andmay progress to become papular or verrucous[5]. They appear to be stuck to the skin surface and, in fact, occur totally within the epidermis. The surface characteristics vary with the age of the lesion and its location. Those on the extremities are often subtle, flat, or minimally raised and are slightly scaly with accentuated skin lines. Lesions on the face and trunk vary considerably in appearance, but the characteristics common to all lesions are the well-circumscribed border, the stuck-on appearance, and the variable tan-brown-black color. When the border is irregular and notched, the SKs resemble a malignant melanoma[7].

***Leser-Trélat* sign:** In the context of internal malignancy, individuals can develop multiple, eruptive SKs also known as the *Leser–Trélat sign*. Adenocarcinoma of the stomach is the most commonly associated malignancy, thoughadenoca - rcinoma of the lung and colon has also been linked. Other diseases reported to occur with eruptive SKs are leukemia, lymphoma, lepromatous leprosy, human immunodeficiency virus infection, erythrodermic eczema and melanoma.20–23 inflammatory eruptive SKs during chemotherapy, especiallycytarabine, are known to occur[8]. The eruption of *Leser-Trélat* should begin at approximately the same time as thedevelopment of the cancer, have a rapid onset and run a parallelcourse in regard to growth and remission of the cancer. The lesions areoften pruritic [9]. Skin tags, tripe palms and acanthosisnigricans may also be associated with *Leser–Trélat sign* [10].

Histopathology: Six histologic types (hyperkeratotic, acanthotic, adenoid or reticulated, clonal, irritated, and melanoacanthoma) are distinguished[4]. The *acanthotic* SKs is the most common histologic type. It usually presents as a smooth surfaced, dome-shaped papule. Slight hyperkeratosis and papillomatosis are often present. The *hyperkeratotic*type of SKs is almost the morphologic reverse of the acanthotic type. Acanthosis is present but there is more prominent hyperkeratosis and papillomatosis. The hyperkeratotic type is the variant often described as having epidermal projections resembling "church spires", a finding also seen in acrokeratosisverruciformis. The *reticulated* or *adenoid* type of SKs is characterized histologically by delicate strands of epithelium that extend from the epidermis in an interlacing pattern. *Clonal* SKs are considered by some to represent a variant of irritated SKs. The clonal type of SKs is characterized by having well defined nests of loosely packed cells within the epithelium [5]. Most seborrheickeratoses demonstrate acanthosis, varying degrees of papillomatosis, hyperkeratosis, and at times keratin accumulations within the acanthotic epidermis (pseudo-horn cysts). The epidermal cells lack cytologicatypia, except at times in the irritated variant where typical normal mitoses may occur.Poor correlation between the clinical appearance and the observed histology, unlike for inverted follicular keratosis, dermatosispapulosanigraand stucco keratosis, where the histologic features are characteristic and match the clinical lesion [4].

Differential diagnosis: The differential diagnosis usually poses no problems in mostcases, but clinically atypical lesions can be a challenge. Themost difficult, especially for the non-dermatologist, is to differentiatethe solitary black seborrheic keratosis from malignant melanoma.The regularly shaped verrucous lesion is often differentfrom the smooth surfaced and slightly infiltrating pattern ofmelanoma. Dermoscopy can sometimes be of great value.Actinic keratoses are usually erythematous, more sharplyrough and slightly scaly. The edges are not sharply demarcatedand they occur most often on the face, bald scalp andbacks of the hands. Nevi may be closely simulated[4]. Dermatosispapulosanigrais a long winded name for acommon variant of seborrhoeickeratoses affecting blackadults.Multiple pigmented papules, just raised or filiform,appear on the face and neck but may extend to the trunk. Histologicallythey are like SKs. The conditionmay run in families, being inherited as an autosomal dominanttrait.Stucco keratosesare another variant of SKsand are seen most often around the ankles after theage of 50. They have a similar 'stuck on' appearance to SKs and are small (1–2 mm) white keratoticpapules that are easily lifted off the skin with a finger nailwithout bleeding[11].

Treatment: First of all, not all seborrheickeratoses need to be treated and many health plans do not pay for their treatment because they are benign lesions. A patient frequently want them removed for cosmetic reasons or because they are pruritic and when the lesion has an atypical clinical appearance and a malignancy (such as squamous cell carcinoma or basal cell carcinoma) is in the differential diagnosis [12]. They are easily removed with cryosurgery or curettage. Lesions to be curetted are first anesthetized with lidocaine introduced with a needle. With multiple strokes, a small curette is smoothly drawn through the lesion. Seborrheic keratosis on the face or on other areas with inappreciable underlying support can be softened before curettage with the electrocautery[4].

Dermoscopy: (Other names for dermoscopy Dermatoscopy, Epiluminescence microscopy (ELM) andSkin surface microscopy). Dermoscopy is an in vivo noninvasive diagnostic technique that magnifies the skin in such a way that color and structure in the epidermis, dermoepidermal junction and papillary dermis become visible. This color and structure cannot be seen with the naked eye. With training and experience, dermoscopy has been shown to significantly increase the clinical diagnosisof melanocytic, non-melanocytic, benign and malignant skin lesions, with a 10-27% improvementin the diagnosis of melanoma compared to that achieved by clinical examination alone[13]. Dermoscopy helps to differentiate melanomas from benign nevi and frommimickers such as pigmented basal cell carcinoma, seborrhoeickeratoses or haemorrhages under the skin. A meta-analysis published in 2008 showed that, among dermatologists, dermoscopy increased diagnostic accuracy in pigmented skin lesions (90% diagnosedmelanoma correctly versus 74% without dermoscopy), without any difference in specificity. One randomized trial of dermatologists trained in dermoscopy demonstrated a 42%reduction in unnecessary biopsy compared with that using naked eye examination alone. Dermoscopy has also been shown to be increasingly useful in the diagnosis ofa variety of other dermatological conditions. It can aid in finding burrows in scabies, locating a splinter, evaluating alopecia and evaluating nail fold capillaries in systemicsclerosis[14]. It has been successfully used in the diagnosis of not only melanocytic skin lesions but also non-melanocytic skin lesions like seborrheickeratosis[15].

The dermoscopic features of SK are:

- ***Milia-like cysts:*** They are white-to-yellow, round structures that appear very bright when contrasted with their dark brown or black surroundings. the cysts correspond to intraepidermal, keratin-filled cysts.
- ***Comedo-like openings:*** They are round to ovoid craters that have black or brown comedo-like plugs. Histologically, they correlate with keratin-filled invaginations of the skin surface.
- ***Fissures and ridges:*** Fissures (sulci) are comedo-like openings, which are not round but rather linear and appear as dark brown to black linear to curvilinear structures within the lesion.
- ***Pigment like network:*** Interlacing fissures and ridges can create an appearance of network-like structures.

- ***Cerebriform pattern:*** Multiple fissures (sulci) and ridges (gyri) may produce a cerebriform pattern.
- ***Fat fingers:*** They are linear and wide dermoscopic structures corresponding to ridges. They often appear as short sausage-shaped
- structures.
- ***Sharply demarcated borders:*** As known from clinical examination, seborrheickeratoses often have sharply demarcated borders
- ***Typical hairpin blood vessels:*** Some seborrheickeratoses are associated with hairpin vessels. These hairpin vessels can appear as perfect "U"-shaped vessels as that are twisted upon themselves [19].

Aim of the study: To describe the morphological features of seborrheic keratosis as seen by dermoscope and to investigates their prevalence.

Patients and Methods: This is a cross sectional study conducted in dermatology teaching center in Alsulaimanyia for the period from 1st of April 2018 to 1st of March 2019.

Populations of the study: Most of the patients complaining of seborrheic keratosis presented to dermatology teaching center in Alsulaimanyia during the period of the study, while some of the patients presented to the center for other skin disease and SK observed by the researcher accidentally.

Sampling: A sample of 60 patients with seborrheic keratosis presented tothe dermatology teaching center.

Data collection: The data were collected directly by the researcher from the patients through direct interview and fulfilling of prepared questionnaire. The questionnaire was designed by the researcher and the supervisor. The questionnaire included the following; demographic characteristics: name, age, sex, occupation, site of the lesion, Fitzpatricks skin type, other signs of chronic sun exposure, color of the lesion and general examination to exclude sign of *leser-trelat*. A clinical photograph (using iPhone 7phone camera) and registration of the dermoscopic finding using DL1 dermoscope (DermLite, 3Gen, SAN Juan Capistrano, CA, USA) (magnification *10) that is used without immersion oil because of the presence of polarized filter. The dermoscope with its adapter was attached to iPhone 7phone. Dermoscopic features (like milia-like cyst, comedo-like opening, well demarcation and etc.) were seen and the photographs were taken by the camera of the phone. In all patients, the diagnosis was made on clinical bases, so biopsy only done for questionable cases to confirm the diagnosis. In this study biopsy was done in two cases only.

Ethical consideration

- Approval was taken from Alsulaimanyia dermatology teaching center authority.
- Oral consent was taken from patients or their relatives.

Statistical analysis: Collected data were tabulated in Microsoft excel spread sheath and by using SPSS program version 18. Descriptive statistics described as (mean ± standard deviation) and frequencies as percentages. Chi square test was used for comparison between categorical data. In all statistical analysis P-value was ≤ 0.05.

RESULTS

A total of 60patients with seborrheic keratosis were included in our study, the mean age of the patients was 58.8 ± 7.6 years and most patients in the present study were in age group 50y – 60y (56.7%) as shown in table 1.Male gender (88.3%) predominate female gender (11.6 %) as shown in table 1.

Table 1. Demographic distribution of SKs

Variable	No.	Percent (%)
Age (year) (mean ± SD)	58.8 ± 7.6	
< 50 yr.	5	8.30%
50 - 60 yr.	34	56.70%
61 - 70 yr.	19	31.70%
> 71 yr.	2	3.30%
Total	60	100%
Gender		
Male	53	88.30%
Female	7	11.70%
Total	60	100%

The site of the lesions in the majority of cases was on the face (66.7%) as demonstrated in table 2.

Table 2: Site of the lesions

Variable	No.	Percent (%)
Face	40	66.7%
Scalp	13	21.7%
Chest	4	6.7%
Neck	1	1.7%
Shoulder	1	1.7%
Trunk	1	1.7%
Total	60	100%

The colors of the lesion of the studied patients were: dark brown (55%), light brown (43.3%) and black (1.7%). The morphological types of the lesion of the studied patients were: patch(43.3%), papulonodule(30%) and plague (26.7%). Fitzpatrick's skin phenotypes of the patients were type III (33.3%) and type IV (66.7%)as shown in table 3.

Table 3: Clinical characteristics of SKs

Variable	No.	Percent (%)
Color of the lesion		
Dark brown	33	55%
Light brown	26	43.3%
Black	1	1.7%
Total	60	100%
Type of the lesion		
Patch	11	18.3%
Papulonodule	23	38.3%
Plague	26	43.4%
Total	60	100%
Skin phenotype		
III	20	33.3%
IV	40	66.7%
Total	60	100%

Other signs of chronic sun exposure that have been identified in the studied patients were: solar lentigines(31.7%), telangiectasia (16.7%), solar lentigines with telangiectasia (11.7%), cutis rhumboidalisnuchae(6.7%), poikiloderma of civatte(3.3%), actinic keratosis (1.7%), Basal cell carcinoma (1.7%), favre-racouchot syndrome (1.7%). 25% of the studied patients not showing any signs of chronic sun exposureas shown in table 4.

Table 4. Other signs of chronic sun exposure

Variables	No.	Percent (%)
Other signs of chronic sun exposure		
Solar lentigenes	19	31.7%
Telangiectasia	10	16.7%
Solar lentigenes with telangiectasia	7	11.7%
Cutis rhumboidalisnuchae	4	6.7%
Poikiloderma of civatte	2	3.3%
Actinic keratosis	1	1.7%
Basal cell carcinoma	1	1.7%
Favre-racouchot syndrome	1	1.7%
No other signs	15	25%
Total	60	100%

The dermoscopical findings of SKs of the studied patients were: milia-like cyst (73.3%), comedo-like opening (31.7%), well demarcation (31.7%),moth eaten border (28.3%), fissures and ridges (18.3%), pigment like network (16.7%), fat finger (8.3%) and hairpin vessels (3.3%)as shown in table 5 and figure 1.

Table 5. Dermoscopical features of seborrheic keratosis

Variables	No.	Percent (%)
Dermoscopical findings		
Milia like cyst	44	73.3%
Comedo like opening	19	31.7%
Well demarcation	19	31.7%
Moth eaten border	17	28.3%
Fissures and ridges	11	18.3%
Pigment like network	10	16.7%
Fat finger	5	8.3%
Hairpin vessels	2	3.3%

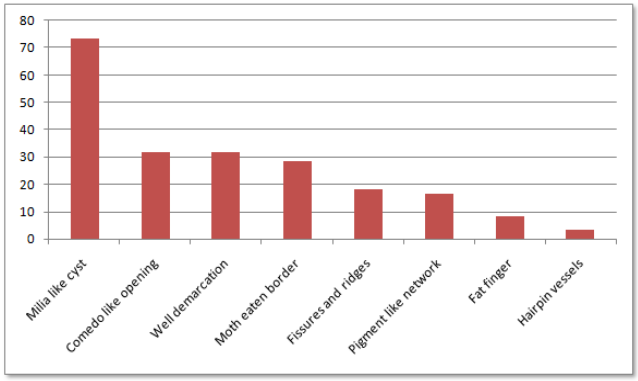


Figure 1. Dermoscopical features of SK

Combined dermoscopical findings of SK forming 85% of the studied patients, and the most common combination were milia-like cyst with comedo-like opening (18.3%) and milia-like cyst with moth eaten border (16.6%) as shown in table 6.

Table 6. Combined features of SK

Combined findings	**No.**	**Percent (%)**
comedo with fissures	2	3.3%
comedo with well demarcation with milia	5	8.3%
milia with fat finger	1	1.6%
milia with fissure with well demarcation	6	10%
milia with comedo	11	18.3%
milia, comedo with hairpin	2	3.3%
milia, fat finger with pigment like network	4	6.6%
milia with moth eaten border	10	16.6%
milia with pigment like network	7	11.6%
milia with fissure	3	5%

.

A significant correlation was found between Fitzpatrick's skin type IV and some dermoscopical findings of seborrheic keratosis as shown in table 7.

Table 7. Significant correlation between skin phenotype and dermoscopical findings of SKs

Dermoscopical findings	skin phenotype IV	P-value
Comedo-like opening	9	0.032 (S)*
Fissures and ridges	10	0.05(S)*

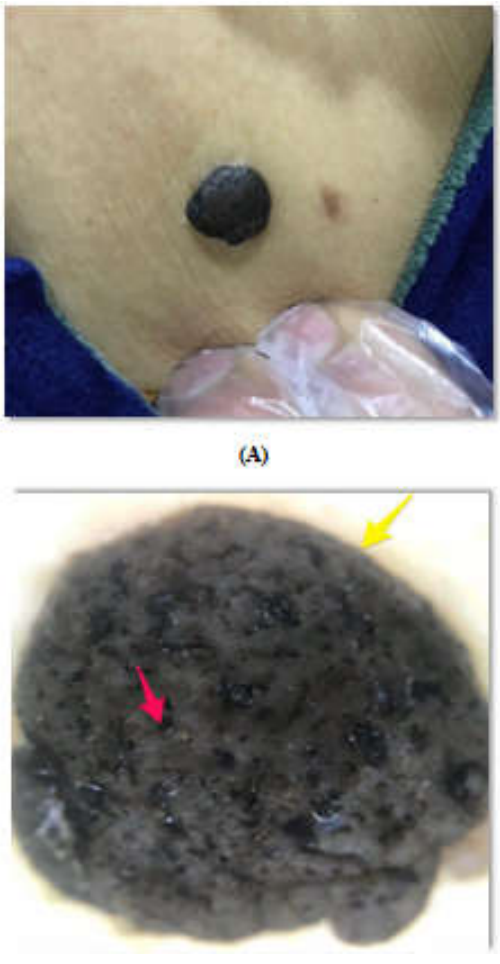
*Significant

A significant correlation was found between the dermoscopical finding "moth eaten border" and the morphological type of the lesion of SKs (patch and papulonodule), P-value < 0.05 as shown in table 8.

Table 8. Correlation between types of lesion and the dermoscopical findings of SKs

Variables	Types of the lesion					
	Patch		Plaque		Papulonodule	
	no.	P- value	no.	P- value	no.	P- value
Dermoscopic features						
Milia-like cyst	9	0.496	19	0.969	16	0.603
Comedo-like opening	2	0.287	9	0.686	8	0.682
Fissures and ridges	2	0.989	5	0.875	4	0.828
Moth eaten border	7	0.004*	8	0.714	2	0.008*
Pigment like network	1	0.456	4	0.816	5	0.406
Well demarcation	0		8	0.909	10	0.072
Fat finger	0	0.268	3	0.432	2	0.481
Hairpin vessel	0	0.496	1	0.847	1	0.73

*significant



(A)

Figure 2. (A) Clinical image of SK.(B) Dermoscopyreveals comedo-like opening (red arrow) and welldemarcation (yellow arrow)

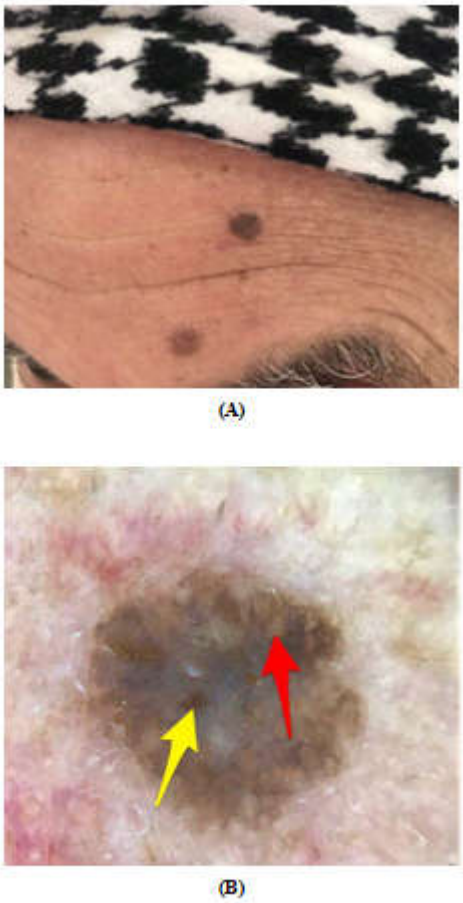


Figure 3. (A): Clinical image of SK. (B):Dermoscopy reveals comedo-like opening (yellow arrow) and milia-like cyst (red arrow).

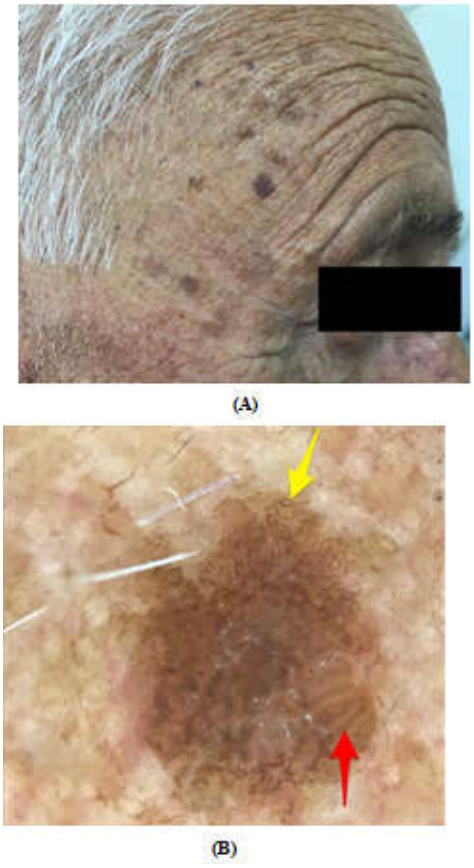


Figure 4. (A): Clinical image of SK. (B):Dermoscopyreveal pigment-like network (yellow arrow) and fat finger (red arrow)

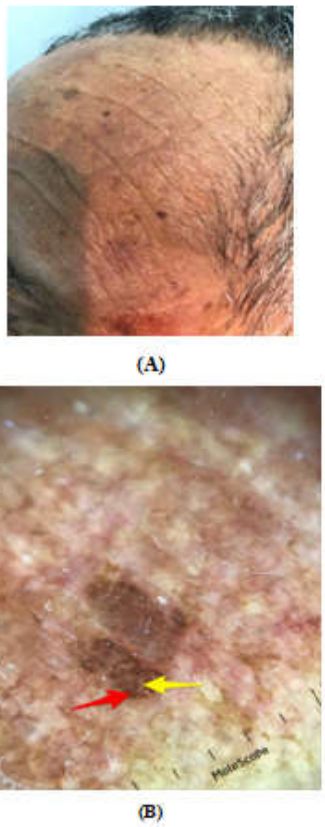


Figure 5. (A). Clinical image of SK. (B):Dermoscopy revealsfissure (red arrow) and ridge (yellow arrow).

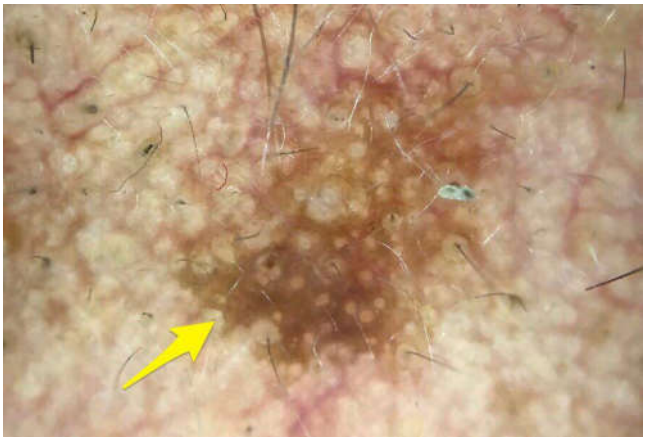


Figure 6. Dermoscopy reveals moth eaten border (yellow arrow).

No significant correlation was found between the dermoscopical findings and the site of SKs, except for (hairpin vessels) on the scalp in which

DISCUSSION

Many clinical and histologic variants of SKs have been described, although they are usually easily recognized clinically, some lesions may prove difficult to diagnose by inspection alone, so biopsy for histopathologic examination may be required. This is especially true when there is a history of recent change or if there is inflammation. Larger dark lesions are sometimes biopsied when there is concern about the possibility of melanoma, but with the advent of dermoscopy, this occurs less frequently[5].

The studied patients were mainly of type IV skin phenotype (66.7%) and most of the patients have other signs of sun exposure especially solar lentigenes(31.7%) and telangiectasia (16.7%). If we compare this studty with other studies, in our study the face predominate over other sites as inJ.Lin,S. Han,L.Cui ,Z.Song (China) [15], while in Ralph Peter Braun (Switzerland) [17] the face is less common site than other areas of the body. Plaque type of lesions predominate in our study over other types of lesion as in Ralpf Peter Braun (Switzerland) [17], while in J.Lin,S.Han,L.Cui,Z.Song (China)[15], papulonodular lesion predominates. Dark brown color of the lesion predominates in our study over other color of lesion similarly to the above mentioned studies. Regarding the dermoscopical findings, in our study milia-like cyst followed by comedo-like opening and well demarcation were the most common features, while comedo-like opening and well demarcation were the most common in Ralph Peter Braun (Switzerland) [17] and fissures and ridges inJ.Lin,S.Han,L.Cui,Z.Song (China) [15] while in Geethu Francis Alapatt (India) [18]comedo-like opening is the most common feature. In our study, thedermatoscopical findings of SKs of the studied patients were: milia-like cyst (73.3%), comedo-like opening (31.7%), well demarcation (31.7%), moth-eaten border (28.3%), fissures and ridges (18.3%),pigment like network (16.7%),fat finger (8.3 %) and hairpin vessels (3.3%). Milia-like cyst in the present study was the most common finding; it was seen in 73.3% of the studied patients.Milia-like cyst is mainly seen in SKs but can also be seen in BCC, congenital nevi and melanoma. However, if the lesion is not melanocytic and is not BCC then the presence of milia-like cyst is diagnostic of SK especially if more than 3 are seen. The cyst correspondsto intraepidermal keratin-filled cyst [19]. Comedo-like opening (31.7%) and well demarcation (31.7%) were the second most common features of SK in our study and these are consistent with Geethu Francis Alapatt study in India[18], while in Ralpf Peter Brown study in Switzerland [17] well demarcation was the most common features this may be due to that the previous study (Ralpf Peter Brown study) focused mainly on pigmented SKs, while our study included pigmented and non-pigmented SKs.Comedo-like openings correspond to keratin-filled invaginations of the epidermis [19].

There were variations in the results of pigment-like network, moth eaten border and fissures and ridges in the present study in comparison with the other study, and fat finger was found only in this study and do not mentioned in the remaining studies (Ralph peter, J.Lin and Geethu studies) and its low incidence may be related to the thickness of the lesion (the lesion should be thicker in order to be formed.) Pigment-like network represent 16.7% of the studied patients while in Ralpf Peter Brown study[17]it represent 46.3%. Pigment-like network represent interlacing fissures and ridges [19]. Its' high percentage in Ralpf Peter Brown study[17]and low percentage in our study may be due to the latter (Ralpf Peter Brown study) one focused on pigmented SKs. The pigment network of malignant melanoma (which is formed by melanin pigment in keratinocytes or in melanocytes along the dermoepidermal junction) should be differentiated from the pigment-like network of SKs in that pigment-like network of SKs is significantly largerthan the delicate and fine reticulated pigment network of malignant melanoma [17]. Fissures and ridges represent 18.3% of the studied patients. It is corresponding to a linear comedo-like opening histologically [19]. Hairpin vessels represent only 3.3% in our study and this is consistent withJ.lin, S.han, L.cui study in China [15], and it is not determined in Geethu Francis Alapatt (India)[18] while it represent 63.5% in Ralpf Peter Brown study (Switzerland) [17], this may be attributed to the dark colored (Fitzpatrick type IV) skin of majority of our patients enrolled in this study in which blood vessels cannot be identified. A very significant correlation was found between the dermoscopical finding (hairpin vessels) and its location on the scalp (P-value 0.009), and this is very important in differentiating SKs from malignant melanoma which also show a dermoscopical feature of (hairpin vessel) but the difference is that hairpin vessel in SKs is surrounded by a whitish halo corresponding to the surrounding keratin, while hairpin vessel in melanoma is surrounded by pink halo [19].

Conclusion

1Milia-like cyst, comedo-like opening and well demarcation were the most common finding of SK in our study. We conclude that milia-like cyst and comedo-like opening are excellent diagnostic criteria for identification of SKs, but the presence of others criteria (fissures and ridges, hairpin vessels, well demarcation, moth eaten border and pigment like network) decrease the risk of misclassification of SKs and have the potential to improve the diagnostic accuracy.

Recommendation

Further large studies and long follow up of patients with SK have been recommended.Also comparative studies between the dermoscopic features of SK and that of malignant melanoma and pigmented BCC have been recommended.

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