

Dermoscopic patterns of seborrheic keratosis on the back

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ABSTRACT

Background: Seborrheic keratosis [SK] is one of the most common benign skin lesion among elderly individuals. SK grows gradually over time and usually has a variable degree of pigmentation. The use of dermoscopy facilitates the differentiation between benign and malignant lesions and to study the various patterns of SK.

Objectives: The aim of this study is to describe different clinical and dermoscopic patterns of seborrheic keratosis on the back in series of cases attending Rumailiah Hospital dermatology Outpatient clinic in Qatar.

Patients and Methods: The prospective study was carried out on 45 patients with seborrheic keratosis on the back at dermatology Outpatient clinic. All lesions were examined both clinically and by using dermoscope, then analyzed and documented according to patterns identified.

Results: Seventy seborrheic keratosis lesions on the back were analyzed in our study, the most common dermoscopic findings included: Sharp borders (68%), raised SK (67%), fissures & ridges (50%), comedo-like opening (47%), moth eaten border (38%) and cerebriform pattern (37%).

In addition to flat SK (33%), milia-like cysts (26%), network like structures (24%), fat fingers (21%) and hairpin blood vessels (7%).

Conclusion: Our study emphasizes the use of dermoscopy in improving the diagnostic accuracy of seborrheic keratosis.

INTRODUCTION

Seborrheic keratosis (SK) is the most common type of benign skin tumor seen by dermatologists in clinical practice.¹ Typically, SK appears as a yellowish, circumscribed papule or plaque, which later becomes more exophytic, brown or hyperpigmented, greasy, adherent squamous material subsequently develops together with a typical keratotic or papillomatous surface that is sprinkled with comedo-like openings. The diagnosis is readily made by clinical and dermoscopic ex-

amination in the majority of cases.²⁻⁴ Dermoscopically, classic SKs usually show multiple milia-like cysts, comedo-like openings, fissures/ridges (brain-like appearance), light brown fingerprint-like structures, and sharply demarcated borders.⁵ Seborrheic keratosis (SK) can sometimes clinically simulate a melanocytic lesion; therefore, a dermoscope is needed to reach correct diagnosis.⁶ Dermoscopy is a noninvasive *in-vivo* technique that allows a better visualization of structures in the epidermis, the dermal-epidermal junction and

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the superficial dermis.^{7,8} Therefore, dermoscopy improves clinical accuracy in diagnosing melanoma and other pigmented and non-pigmented skin lesions.^{9,10}

In addition, a study claimed that dermoscopy increases the accuracy of diagnosing SK from 62 to 77%.¹¹ The most common dermoscopic characteristics of SK (comedo-like openings and milia-like cysts) have a high prevalence, but using additional dermoscopic criteria, such as fissures, hairpin blood vessels, sharply demarcated and moth-eaten borders, improves the diagnostic accuracy.¹²⁻¹⁴

In another study, Zaballos *et al.*¹⁵ stated that histological confirmation is occasionally warranted, especially to rule out malignant processes, but isolated suspicious foci within larger lesions cannot be determined easily to direct pathological sectioning of such suspicious sites within a lesion. The most widely used dermoscopic algorithm for seborrheic keratosis is the two step algorithm proposed on the Consensus NetMeeting on Dermoscopy, including a first step of excluding the presence of pigment network, aggregated globules, branched streaks, homogeneous blue pigmentation or parallel pattern; and a second step of recognizing multiple milia-like cysts, comedo-like openings, fissures/ridges (brain-like appearance) and light-brown fingerprint-like structures.¹⁶

PATIENTS AND METHODS

PATIENTS

The prospective study was carried out on 45 patients with seborrheic keratosis on the back. Participants were selected from outpatient dermatology clinic in Rumalialah Hospital from April 2017 to June 2017.

All patients were subjected to brief dermatological and dermoscopic examination.

INCLUSION CRITERIA

1. Patients of both gender included in the study.
2. Patients above 18 years of age.
3. Patients with seborrheic keratosis on the back.

All patients were consulted to be part of the study and informed consent was obtained. Patients were subjected to full history included (age, race, presence of systemic illness and general state of patient). Also history included duration of lesion and family history of tumors.

General examination was carried out from head to toe. Brief dermatological examination carried out for each patient focusing on the back for seborrheic keratosis lesions.

Dermoscopic examinations of all patients of seborrheic keratosis were performed using the dermoscopy device. We used polarized and non-polarized technique with special media (ethanol) to examine each SK lesion on the back that allowed visualization of deep skin structures.^{17,18} Multiple photos were taken by dermoscope attached to iPhone 6 and 7 plus camera device. Photos were collected with patient code and analyzed by experienced dermatologist. Lesions were classified by pattern and recorded in table.

MATERIALS

A Dermlite dermoscope (DL3N, DL4N, USA), with 20 mm four- element lenses with 10X magnification for DL3N and 25 mm lenses system for DL4N, 28 high powered LEDs illumination, cross polarized and non-polarized illumination. Retractable face plate spaces with 10mm scale. High-performance long-lasting lithium battery. Refined optics and improved visualization of both pigmented and vascular structures. Using a digital

dermoscopic system by attaching the dermoscope to compatible smart phone devices I Phone 6 and 7 plus, extend the spacer and taking sharp, glare-free images easily.

STATISTICAL METHODS

The collected patient data were coded correctly and analyzed using software IBM SPSS (statistic package for social science) version 2015.

RESULTS

A total of 45 patients were enrolled in this study. Patient who presented with multiple SK on the back were included and documented. There were 70 lesions evaluated and analyzed by experienced dermatology consultant. The group comprised of 26 (57%) men and 19 (43%) women. Their ages ranged from 40-85 years (means \pm SD= 63.8 \pm 12 years) (Table 1) (Fig. 1).

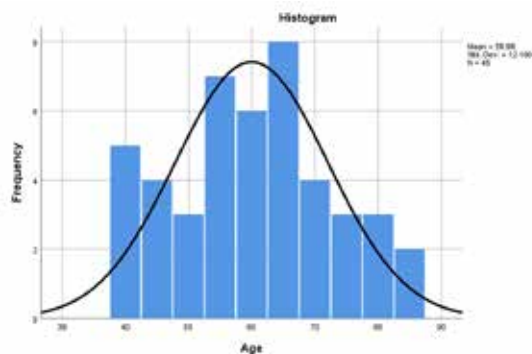


Fig. 1 Histogram showing the age frequency and distribution, mean and standard deviation.

Table 1 Showing the mean age (\pm SD) for males and females

Sex	Mean Age	Std. Deviation
Female	56.24	10.935
Male	62.25	12.400
Total	59.98	12.105

The study was carried out in dermatology outpatient clinic and patients were selected randomly. Among the patients, the vast majority were Qatari nationals, followed by Egyptian then equal numbers of Jordanian and Indian. Other nationalities include European, American and Asian descent.

The duration of lesions varied, with 11 patients having the lesions for 60 months, 8 patients for 120 months and 6 patients for 24 months. We noticed that most of the lesions presented for years and had not been noticed by patients.

All the lesions were measured by dermoscope and recorded accordingly. The size of lesions ranged from 3 to 13 mm. There were 32 patients with seborrheic keratosis measuring between size in 3-6 mm, 17 patients measuring between size 7-9 mm and 21 patients measuring between size 10-13 mm.

The color of the seborrheic keratosis varies i.e. black, dark brown, light brown and pink. In our study we noticed that the most common lesions presented as light brown (n=42, 60%), followed by dark brown (n=19, 27%). Black pigmented seborrheic keratosis (n=8, 11%) and the least was pink (n=1, 1%).

The site of the lesions over the back was divided in to three quadrants. These quadrants include scapular, mid back and lumbar area. The majority of seborrheic keratosis lesions were found on the lumbar region, with 27 lesions and mid back with 22 lesions. The rest of the lesions were found on the scapular area.

Dermoscopic finding of our study include:

We examined 45 patients with different seborrheic keratosis on the back. Some patients had more than one lesion on the back that was included in our study. A total of 70 lesions were examined and various the microscopic pattern were analyzed.

The most common dermoscopic findings were sharp demarcations (n=48, 68%), raised SK (n=47, 67%), fissure and ridges (n=35, 50%), comedo-like openings (n=33, 47%), moth eaten border (n=27, 38%) and cerebriform pattern (n=26, 37%).

In addition to flat SK (n=23, 33%), milia-like cyst (n=18, 26%), network like structures (n=17, 24%), Fat fingers (n=15, 21%) and hairpin blood vessels (n=5, 7%).

Early SK may reveal network-like or globule-like structures that may be misclassified as melanocytic tumors as the image converted to 2-dimensional dermoscopy. The use of ink may help dermatologist to view 3-dimensional morphologic characteristics of seborrheic keratosis by the dermoscope.¹⁹ We selected one patient and used the ink to identify features of seborrheic keratosis with the dermoscope and compared it with the image taken before the ink which highlighted the finding of comedo-like opening and milia-like structures (Fig. 2).

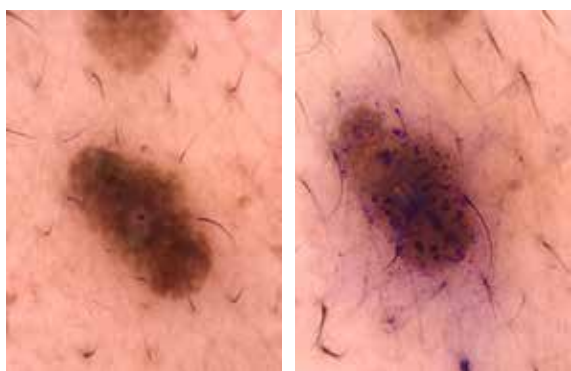


Fig. 2 Dermoscopic photograph of Seborrheic keratosis on lumbar area showing comedo-like opening & milia-like cyst before and after using the ink.

DISCUSSION

Site differences in dermoscopic pattern of melanocytic nevi were reported.²⁰ Anatomical sites differ in many histological aspects and disease preference and predilection. Internally, there is variability

between sites due to differences in thickness of layers of epidermis and dermis, density and types of adnexal structures as terminal hair follicles, sebaceous follicles and sweat glands. These differences are reflected on the dermoscopic findings and patterns of lesions. Hypothetically, dermoscopic features of SK of the back may vary from other anatomical sites as face and legs. We studied back SK lesions for its characteristic patterns as a start.

Seborrheic keratosis is one of the most common benign epithelial neoplasms.^{21,22} Although the clinical morphology of seborrheic keratosis generally allows dermatologists to make a diagnosis, there are still a number of seborrheic keratosis that clinically resemble verruca vulgaris, melanocytic nevus, malignant melanoma, basal cell carcinoma and Bowen's disease, posing problems of differential diagnosis.²³

SK diagnosed on a clinical basis with the aid of dermoscopy that is a non-invasive, *in vivo* method to visualize specific features and patterns of various lesions.^{24,25}

We chose to study Seborrheic keratosis (SK) because it is the most frequently encountered cutaneous neoplasms in clinical practice. It has no sex predominance. It has a wide variety of clinical presentations and generally distributed over different body sites. Interestingly this common benign condition may mimic serious malignant conditions such as melanoma and may even coexist with skin cancers like basal cell carcinoma and squamous cell carcinoma.^{26,27}

The first and most common dermoscopic features described for seborrheic keratosis were comedo-like openings and milia-like cysts.^{28,29} Then in 2001 on the Consensus NetMeeting on Dermoscopy, a two-step algorithm using multiple milia-

like cysts, comedo-like openings, fissures/ridges (brain like appearance) and light-brown fingerprint-like structures was proposed for the diagnosis of seborrheic keratosis.¹⁶ In 2002, Braun et al. evaluated the dermoscopic features of 203 pigmented seborrheic keratosis and added additional criteria such as fissures, hairpin blood vessels, sharp demarcation and moth-eaten borders.³⁰

In our study, we aim to determine different pattern of seborrheic keratosis using non-invasive technique i.e. dermoscopy that allows a better visualization of structures in the epidermis and minimize the need for invasive procedure i.e. biopsy.³¹ The following Dermoscopic definition of seborrheic keratosis patterns have been recognized:

Milia-like cysts are round, yellowish or whitish structures that correspond to small intraepidermal, keratin filled cysts (Fig. 3 & 4). Comedo-like openings are blackhead like plugs on the surface of the lesion (Fig. 5). Moth-eaten borders are concave invaginations of the lesion border^{32,33} (Fig. 6). Hairpin blood vessels correspond to long capillary loops that are seen in keratinizing tumor. They present as clusters of blood vessels and have whitish halo with “grapelike” appearance^{34,35} (Fig.7). Network like structures represent lines within structures that are hyperpigmented and end abruptly at the periphery (Fig. 8). Fissures are irregular, linear, keratin filled depressions (Fig. 9 & 10). Cerebriform patterns correspond to Multiple fissures and ridges produces “brain like” appearance (Fig. 11 & 12). Fat fingers are linear and wide structures appear as sausage-shaped structures^{36,37} (Fig. 13 & 14).

We compare our results with other studies looking for the common patterns of seborrheic keratosis using the dermoscopy that aid in reaching the accurate diagnosis.



Fig. 3 & 4 Dermoscopic photographs of seborrheic keratosis on scapular area showing milia-like cyst.



Fig. 5 Dermoscopic photograph of seborrheic keratosis on mid back showing comedo-like opening.



Fig. 6 Dermoscopic photograph of seborrheic keratosis on lumbar area showing moth-eaten borders.

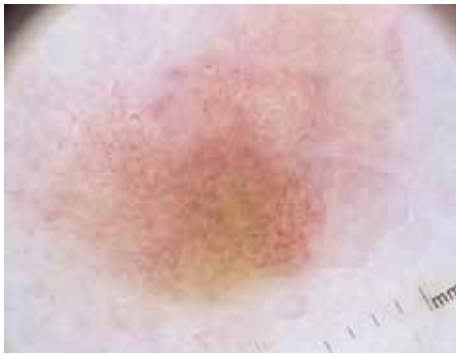


Fig. 7 Dermoscopic photograph of seborrheic keratosis on mid back showing hairpin blood vessels.



Fig. 11 & 12 Dermoscopic photographs of seborrheic keratosis on lumbar area showing cribriform patterns.



Fig. 8 Dermoscopic photograph of seborrheic keratosis on lumbar area showing network-like structures.



Fig. 9 Dermoscopic photograph of seborrheic keratosis on lumbar area showing fissure & ridges, sharp demarcation and moth-eaten border.



Fig. 13 & 14 Dermoscopic photographs of seborrheic keratosis on lumbar area showing cribriform patterns.

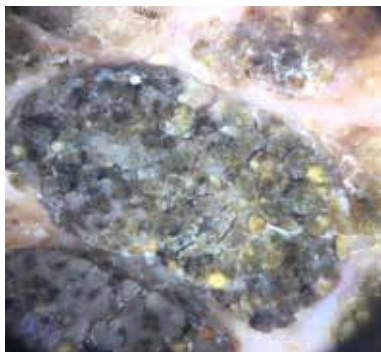


Fig. 10 Dermoscopic photograph of seborrheic keratosis on lumbar area showing fissures & ridges.

Sharp Borders had the highest prevalence among the three reviewed studies done by Braun et al 2002,³⁰ Lin et al 2014³⁸ and Abdel-Azim et al 2015,¹¹ as it showed a percentage of (90%), (70%) and (82%) respectively. This supports our finding in the study with (68%) compared to other patterns of seborrheic keratosis (Table 2).

Fissures and ridges seen relatively high in Baun et al and Lin et al study by (61%) and (60 %) respectively. However, they may also be seen in nevi with congenital patterns and sometimes in common melanocytic nevi. The presence of multiple fissures might give a "brainlike" appearance to the lesion.³⁹

Comedo-like opening and milia-like cyst were considered most important dermoscopic criteria for diagnosis of seborrheic keratosis in previous study. It was shown in three studies (Table 2) that both of these patterns were present in many pa-

Table 2 Comparison of seborrheic keratosis patterns with other reviewed articles

Study	Our results	Braun et al 2002(30)	Lin et al 2014 (38)	Abdel-Azim et al 2015 (11)
Number of lesions	70	203	416	50
Site	Back only	Whole skin	Whole skin	Whole skin
Sharp borders	68%	90%	70%	82%
Fissures & ridges	50%	61%	60%	16%
Comedo-like openings	47%	71%	39%	50%
Moth eaten border	38%	46%	7%	34%
Milia-like cysts	26%	66%	19%	26%
Network like Structures	24%	46%	2%	1%
Hairpin blood vessels	7%	63%	6%	2%

tients by (71%), (39%) and (50%) of comedo-like opening respectively. Whereas, milia-like cyst presents in (66%), (19%) and (26%) respectively among the studies. In our study, 33 lesions (47%) had comedo-like openings, and around 18 lesions (26%) had milia-like cysts.

The term moth-eaten border was found in (46%) in Braun et al study, whereas it shows relatively low percentage (7%) in Lin et al study and they concluded that these features more often seen in early seborrheic keratosis (patch type). Our study showed (38%) and according to Schiffner et al⁴⁰ is also seen in solar lentiginos.

Network like structure shown in 17 lesions (24%), which is relatively high compared to Line et al (2%) and Abdel-azim et al (1%) which raise the importance of the proper identification of pigment network (diagnostic dermoscopic features for melanocytic skin lesion) and network like structure that may be seen in seborrheic keratosis.⁴¹

Hairpin blood vessels, were found in 5 lesions (7%) 4 out of 5 lesions were raised, according to Kreusch and Koch⁴² they correspond to long capillary loops, commonly seen in keratinizing tumors, and are mainly found at the border or in the periphery of the lesions.

Braun et al in their study concluded that milia-like cysts and comedo-like openings are excellent diagnostic criteria for the identification of the majority of seborrheic keratosis, but the use of other criteria (fissures, hairpin blood vessels, sharp demarcation, and moth-eaten border) decrease the risk of misclassification of pigmented seborrheic keratosis and has the potential to improve the diagnostic accuracy of such lesions, especially the challenging cases.³⁰

Comparing our findings with other comparable studies (Table 2) we could not find any significant

differences in dermoscopic patterns of back lesions in our studies and patterns of SK of whole skin in other studies. This may be due to smaller sample sizes. However, the assumption of possible site pattern differences still unproved and not denied yet.

CONCLUSION

We conclude that dermoscopy represents a reliable diagnostic tool that helps in recognizing benign and suspicious lesions for appropriate management. Patients with seborrheic keratosis show specific patterns (e.g. sharp demarcation, fissures& ridges, milia-like and comedo-like opening) that aid dermatologist in reaching accurate diagnosis.

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