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Editorial

Dermoscopy: new dimensions beyond pigmentary lesions

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Dermoscopy (also known as dermatoscopy, epiluminescence microscopy, amplified surface microscopy, and surface diascopy) is a noninvasive examination technique of evaluation of the colors and microstructures of the epidermis, dermo-epidermal junction, and papillary dermis not visible to the naked eye; hence, enhancing the diagnostic accuracy. It is primarily used to judge pigmented and nonpigmented skin tumors more exactly, whether or not the lesion should be biopsied.[1]

The dermoscope is a magnifying glass usually with 10-fold magnification. The older devices needed a contact medium (immersion oil) to make the upper layer of the skin, the stratum corneum, transparent and thus render submacroscopic structures of the basal layers of the epidermis and the upper dermis visible.[2] However, the new versions employ polarized light and in contrast to traditional dermoscopes do not require a contact medium and direct physical contact between the optical lens and skin.[1,2] This not only reduces the risk of possible transfection but also make the instrument portable and use more frequently in the clinical practice.

The dermoscopy era ushered in 1980 in Vienna and the International Dermoscopy Society (IDS) was founded in 2001. The use of dermoscopy is spreading worldwide and about 4000 clinicians joined the IDS as regular members, from more than 110 different countries. Almost 1000 papers have been published between 2003 and 2007, and about 300 dermoscopy papers have been referenced in Pubmed just in 2008.[3]

Dermoscopy was primarily evolved for the assessment of pigmented lesions of the skin especially for the early recognition of the malignant melanoma. Standard dermoscopic verbiage and dermoscopic neologisms have gradually evolved over 20 years. Several approaches (pattern analysis, ABCD rule, seven-point checklist, Menzies method, revised two-step pattern analysis, ABC rule, and three-point checklist) are now in popular use for the correct differentiation of pigmented lesions as melanocytic versus nonmelanocytic, and, secondly, characterization of their features as benign, suspicious, or malignant.[4,5] The addition of dermoscopy to classic unaided eye examination in melanoma screening improves the accuracy of melanoma detection, especially for formally trained operators. Recent data have definitely proven the increased sensitivity for diagnosing melanoma as compared to naked eye examination alone.[5-8]

During recent years the horizon of dermoscopy has extended much beyond the pigmentary

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lesions. The new fields added to classical dermoscopy include entodermoscopy for the diagnosis of skin infections and infestations, inflammoscopy for the diagnosis of inflammatory skin diseases, tricoscopy for hair and scalp disorders and teledermoscopy which has facilitated the worldwide exchange of knowledge and expertise, and provides the ultimate platform for second opinion.[3]

Dermoscopy facilitates the *in vivo* diagnosis of various skin infections and infestations such as viral warts, molluscum contagiosum, tinea nigra, scabies, tungiasis, pediculosis, myiasis, larva migrans, ticks, and lupus vulgaris. Dermoscopy connects the research fields of dermatologists and entomologists opening a new research field: entomodermoscopy.[9]

Dermoscopy patterns are seen in many common inflammatory dermatoses e.g. psoriasis vulgaris, that usually presents dotted vessels, and lichen planus that presents characteristic whitish striae on dermoscopy. Dermoscopy, besides helping in the diagnosis, can be used to monitor treatment response.[10]

Dermoscopy features of hair loss and dystrophy like vascular pattern, follicular and perifollicular signs and hair shafts characteristics have been determined.[11] Similarly, many common inflammatory scalp diseases including seborrheic dermatitis, psoriasis, chronic discoid lupus erythematosus, lichen planopilaris, and also pemphigus vulgaris and pemphigus foliaceus can be distinguished on the basis of dermoscopy features.

Correlation between dermoscopic patterns and genetic background in some melanocytic tumors has been found. The presence of MC1R red hair polymorphism has been associated with early melanomas that under dermoscopy show fewer colors or fewer features.[8] To better understand the modifying effect in pigmentation and pigmented lesions of the coexistence in mutations in CDKN2A (main gene responsible of familial melanoma) and polymorphisms in the MC1R, an *in vivo* model in mice with grafts of bioengineered human skin has been developed. Similarly dermoscopy in albino patients may facilitate the early recognition of amelanotic melanoma and may improve the early detection of tumours in some genetic syndromes e.g. xeroderma pigmentosum.[12]

Dermoscopy also serves as a window into nevogenesis. Because most dermoscopic structures have definite histological correlates, clinicians can evaluate and monitor nevi over time in different patients cohorts and age groups deducing histological appearance of nevi without resorting to a skin biopsy. This also brings to question the validity of the hypothesis that nevi evolve from junction to compound to intradermal nevi.

Based on the differences in dermoscopic features, it is hypothesized that lentigo maligna (LM), superficial spreading melanoma (SSM) and nodular melanoma (NM) derive from stem cells in the human hair follicle, the epidermis and the dermis respectively. This model provides new explanations for the differences between LM, SSM and NM.[3]

Nowadays the integration of dermoscopy and reflectance confocal microscopy is used not only in research but also in clinical practice in many situations as the delimitation of margins or relapses in facial lentigo maligna, or the diagnosis and follow up of BCC treated with imiquimod or photodynamic therapy. As both imaging techniques have a limitation in depth, the complementation with ultrasonography is of special interest.[3]

As the list of new applications of dermoscopy is expanding, the dermatoscope has become the dermatologist stethoscope, providing a link between clinical and histopathological diagnosis. Because most dermoscopic structures have definite histological correlates, the need for skin biopsy may be minimized. It allows to observe not only the static *in vivo* morphology of lesions but also the longitudinal evaluation of dermoscopic structures over time. Hence, it can be considered as both a first level screening tool for skin cancer detection, and as a second level tool for the digital imaging follow up of patients with multiple skin lesions.

It appear likely that dermoscopy will no longer be used exclusively for the evaluation of pigmented skin lesions, but also for diagnosing infectious as well as other inflammatory diseases in general dermatology. Today more than 80% of the German and US dermatologists are using dermoscopy in the daily practice. Unfortunately, dermatoscopy has not gained foothold in the clinical practice of dermatologists in Pakistan. Reasons for its restricted use may be unawareness about new dimensions of its use, lack of training facilities, time pressure or psychological inertia to accept a new change.

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