



IADVL

IADVL SIG Dermoscopy (IADVL Academy) Newsletter

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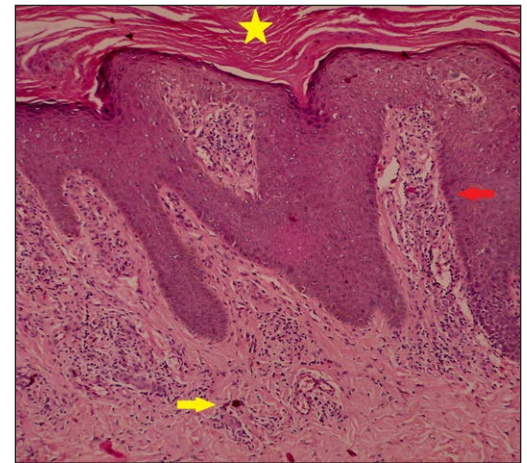
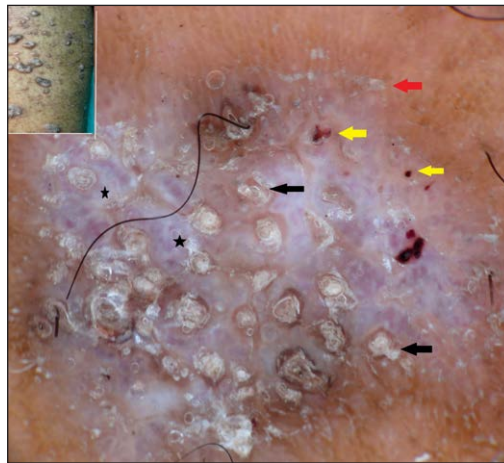
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Editorial

Dermoscopy has gone a long way from being a curiosity to being a modality in supporting the diagnosis of several dermatoses in addition to melanoma where it is well established. The gathering evidence on this modality has led us to believe that in several conditions, it would help us avoid a more invasive modality to arrive at a diagnosis. In addition, this modality may be useful as an adjunct to therapy to periodically evaluate response such as in melasma as well as to decide whether a particular modality would be useful such as in the management of vascular malformations with lasers.

Amidst all this, with gathering amount of information, some of which may subsequently change with mounting evidence, we keep receiving queries on which conditions dermoscopy may be useful in by beginners and senior dermatologists alike. This newsletter is an attempt to gather together the applications of this modality of therapy so that those at the fence start using this modality in their day to day practice.

Happy reading.

Applications of Dermoscopy

Introduction and Background: Dermoscopy also known as epiluminescence microscopy or skin surface microscopy is a simple non-invasive, in-vivo technique, used to examine the subsurface features of the skin invisible to the naked eye. Use of dermoscopy in the early recognition of skin malignancies, especially melanoma, is well established. The colors seen on dermoscopy underline the depth and nature of the structure being observed. An essential tool in day to day practice as it offers a telescopic view of pigment patterns, vascular patterns and appendageal structures.¹

However, over the last several years, the use of dermoscopy has been increasing in the context of general dermatological disorders like inflammatory dermatoses, pigmentary dermatoses, infectious dermatoses, disorders of hair and scalp, and nail. Some terms are used to describe specific indications: pigmenter microscopy, trichoscopy (dermoscopy of scalp and hair), onychoscopy (nails), inflammoscopy (inflammatory dermatosis), entomodermscopy (skin infestations and infections) and mucoscopy (mucosal surfaces).²

Dermoscopy has significantly increased the sensitivity and specificity of diagnosing melanoma in the hands of experienced users and is now recognized as a good screening test for melanoma, leading to better triage and decreased morbidity and mortality caused by this condition.² Dermoscopy helps differentiate melanocytic from nonmelanocytic lesions and in the surveillance of patients with many melanocytic nevi

Applications

1. Dermoscopy may result in confirmation of clinical diagnosis, often avoiding the need for a skin biopsy. Although a skin biopsy and clinico-pathological correlation (CPC) remain the gold standard for cutaneous diagnosis, but with dermoscopy around, we are gradually moving from CPC to clinico-dermoscopic-pathological-correlation (CDPC). It can reduce unneeded biopsies. (Figures 1, 2) Over the past few years documentation of dermoscopy patterns for general dermatological conditions, other than tumors, has also improved significantly with a focus work especially in patients with a skin of color.

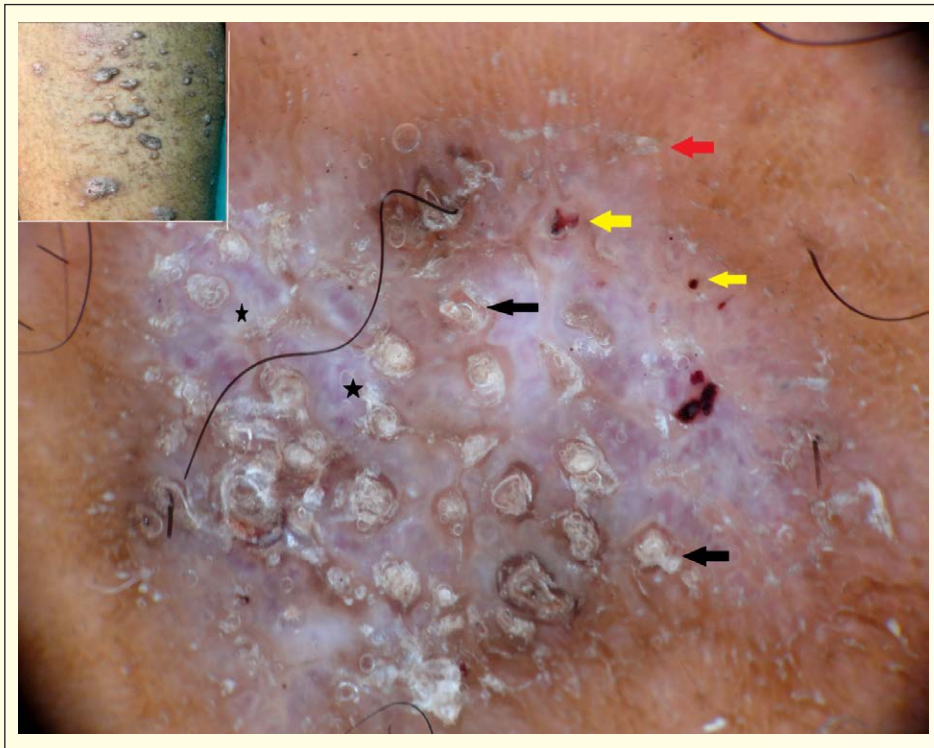


Figure 1: Dermoscopy of hypertrophic lichen planus shows comedo-like openings (black arrows), red dots and globules (yellow arrows), Wickham striae (black stars). Note the bluish-grey background. Inset: clinical image.

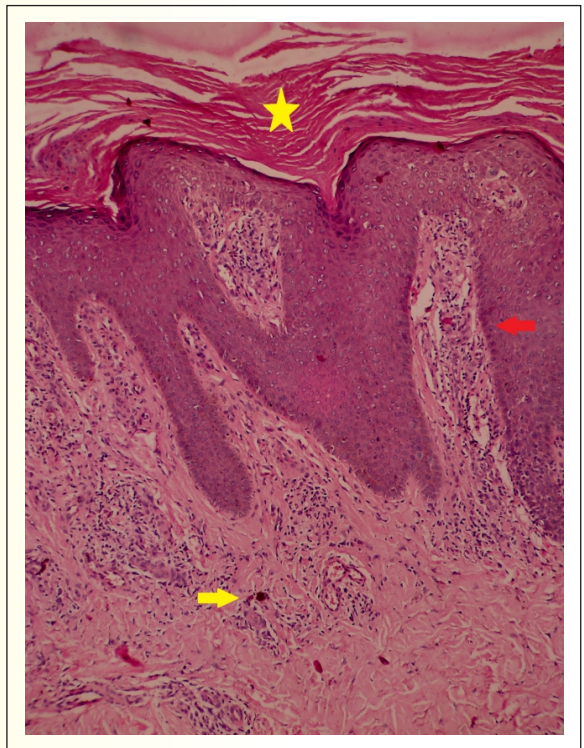


Figure 2: Histopathology of hypertrophic lichen planus shows hyperkeratosis (yellow star), acanthosis, basal cell degeneration (red arrow) and melanophages (yellow arrow) in the dermis. [H&E, 100x]

2. Basic instrumentation for dermoscopy is quite affordable. Compared with some other available instruments used by dermatologists (e.g., reflectance confocal microscopy), dermoscopes, especially hand-held ones, are relatively inexpensive, thus making such technology affordable for most practitioners. Video-dermoscopes need an attachment to the monitor to visualize images directly. The advantage of video-dermoscope is that magnification ranges from 20x to 200x to 400x depending on the manufacturer whereas hand-held manual dermoscope come with magnification of 10x to 16x. These dermoscopes are attached to either dedicated camera or smart phones. (Figure 3, 4, 5).¹



Figure 3: Dermoscopy is attached to a dedicated camera to save the captured images. This adapter makes dermoscope to fit correctly only to recommended model by the company.



Figure 4: DermLite 3 dermoscope (United State America) is fixed to iPhone with the help of universal adapter. This adapter can be used to fix dermoscopy with any smart mobile phones because its vertical arm is adjustable to any angle.



Figure 5: Videodermoscopy showing live demonstration of melanocytic nevus on the nape of the neck. This particular videodermoscope has magnification ranging from 20-160x (FotoFinder, Germany).

3. Dermoscopy helps isolate suspicious foci within larger lesions. Identifying such foci can be useful for directing pathology sectioning of such suspicious sites within a lesion. It can aid in more precisely defining borders of some lesions for improved presurgical margin mapping. An example of this is the ability to recognize subclinical extensions of facial lentigo maligna melanomas using dermoscopy. Several helpful algorithms have been created to aid in classifying lesions of the skin.

4. The main application of dermoscopy in the initial stages has been for differentiation between melanoma and the various benign lesions of the skin including melanocytic nevi (figure 6), solar lentigo (figure 7), simple lentigo, seborrheic keratoses (figure 8), and basal cell carcinoma (figure 9). Some of the other conditions for which dermoscopy was used commonly at the initial stages included – vascular lesions like hemangioma, pyogenic granuloma, cherry angioma (figure 10), actinic keratosis, squamous cell carcinoma, Bowen’s disease (figure 11), clear cell acanthoma and dermatofibromas (figure 12).³

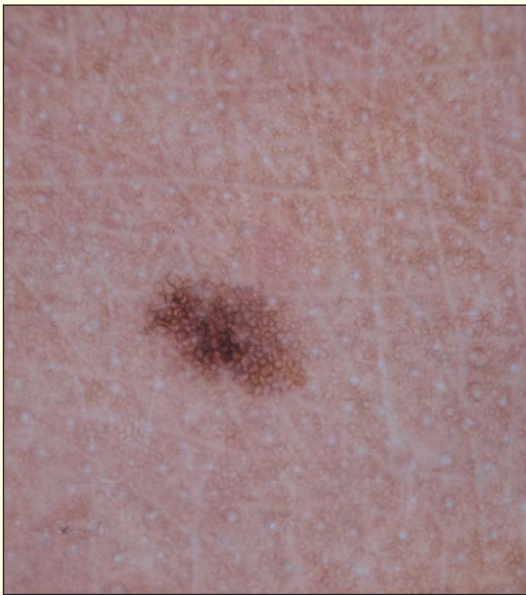


Figure 6: Dermoscopic image of melanocytic nevus. Note the reticulate pigment pattern with uniform intensity of color, diameter of lines and holes and symmetry of the lesion. Darker shades of pigment are expected in skin of

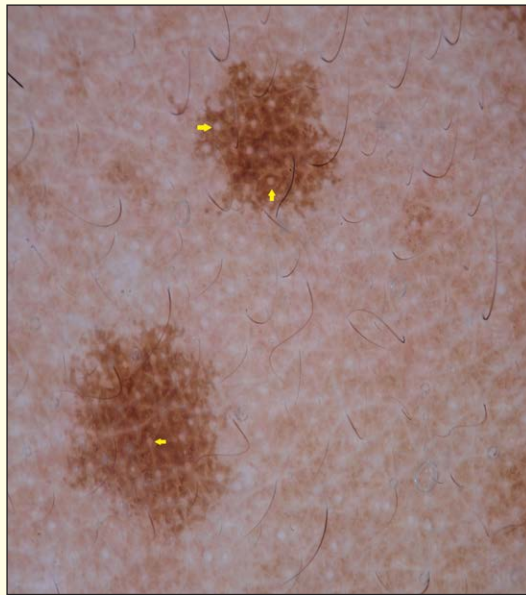


Figure 7: Dermoscopic image of solar lentigo with sharp and abrupt borders. Appreciate the uniform color. White dots indicate follicular openings (yellow arrows).

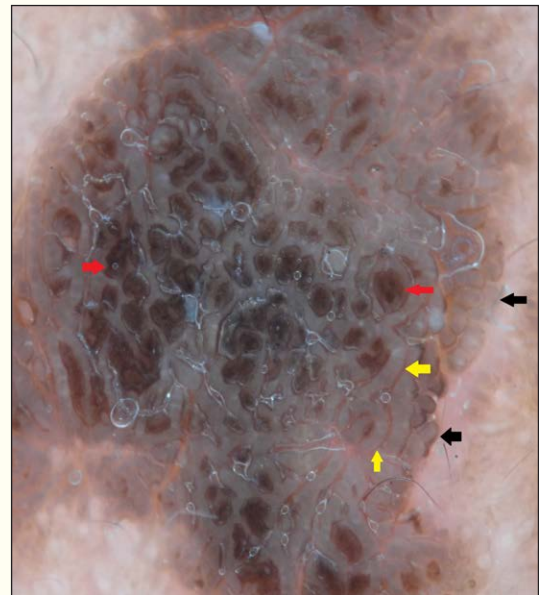


Figure 8: Dermoscopy of seborrheic keratosis shows cerebriform pattern, fat finger-like structures (yellow arrows), comedo-like openings (red arrows) and sharp borders (black arrows). Note the absence of pigment network.

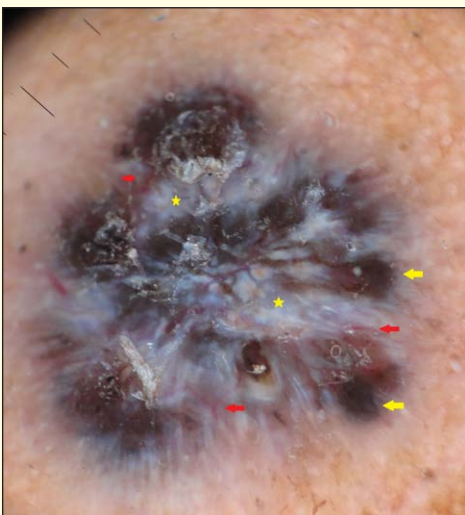


Figure 9: Dermoscopy of basal cell carcinoma demonstrates maple leaf-like structures (yellow arrows), bluish-grey ovoid nests (yellow stars) and arborizing vessels (red arrows). Blue-white veil is well appreciated.

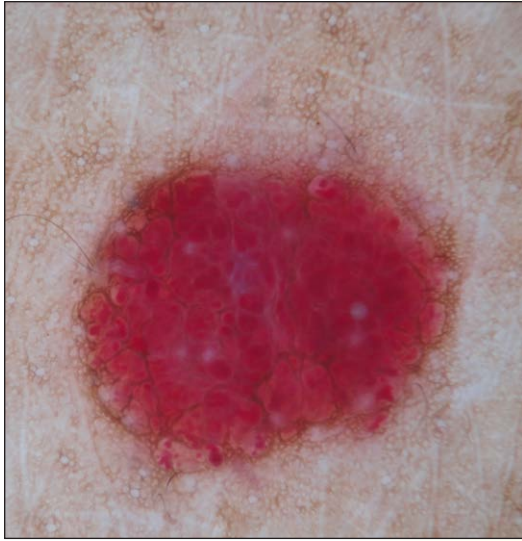


Figure 10: Dermoscopy of cherry angioma shows red lacunae with uniform size and shape. Note the perilesional pigment network.

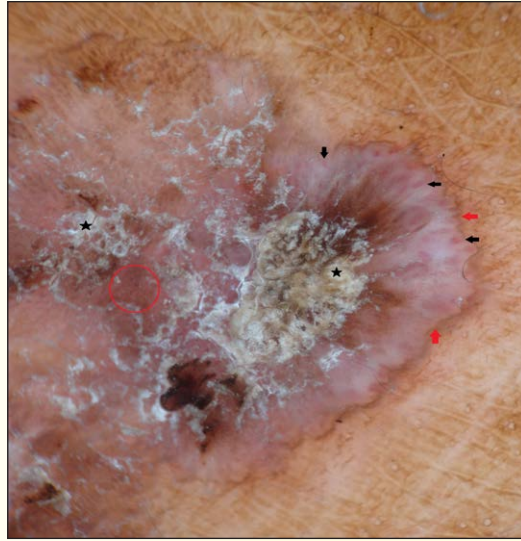


Figure 11: Dermoscopy of Bowen's disease shows white surface scales (black stars), sharp borders (red arrows), brown dots (red circle), and dotted vessels (black arrows).

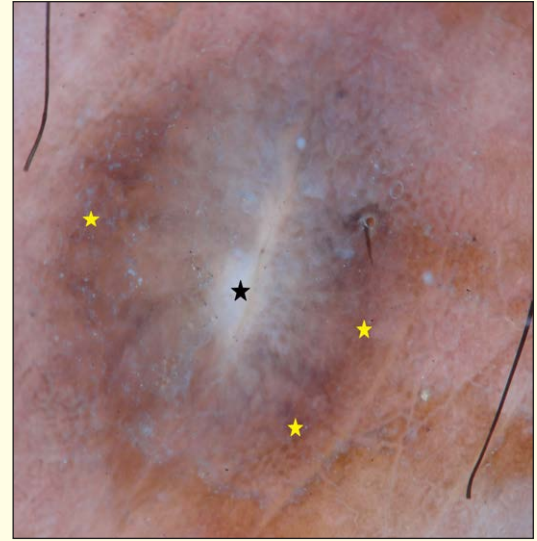


Figure 12: Dermoscopy of dermatofibroma shows white scar-like structureless area (black stars) in the centre with faint pigment network (yellow stars) at the periphery.

Infectious diseases have recently received increasing attention from clinicians practicing dermoscopy. Simple antiseptic precautions should be observed in case a contact plate is being used in the dermoscope. Use of ethanol based antiseptic solution as a linkage fluid acts as self sterilizer. Transparent adhesive tape can also be used to prevent transmission of infectious diseases through dermoscopy. Some of the common infectious diseases which have characteristic diagnostic patterns on dermoscopy include: Molluscum contagiosum and viral warts. Early lesions of molluscum contagiosum, where the central umbilication is difficult to visualize, are easily picked up using dermoscopy. They are seen as multilobular white-yellow amorphous structures surrounded by a crown of vessels (figure 13). The central crater is seen well even with the white light. Viral warts on dermoscopy show the characteristics brown, red or black dots on the hyperkeratotic surface clearly (figure 14). Entomodermoscopy – in the context of conditions like scabies has helped to improve diagnosis in parasitic infestation. Nits (figure 15) and pseudonits can be differentiated by dermoscopy without difficulty. Dermoscopy can also help in the diagnosis of less common cutaneous infections like cutaneous leishmaniasis and deep fungal infections (figure 16).⁴

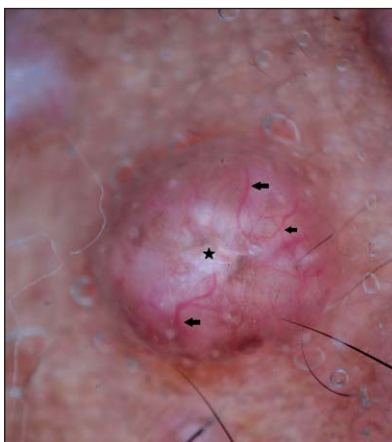


Figure 13: Dermoscopy of molluscum contagiosum shows crown and arborizing vessels (arrows) and central crater (star). Note that vessels are crossing the centre of the lesion.

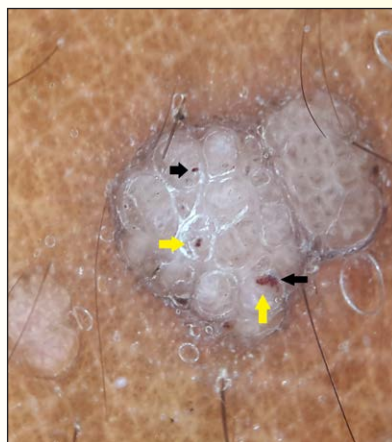


Figure 14: Dermoscopy of viral wart shows red dots (black arrows) at centre surrounded by the whitish halo (yellow arrows).

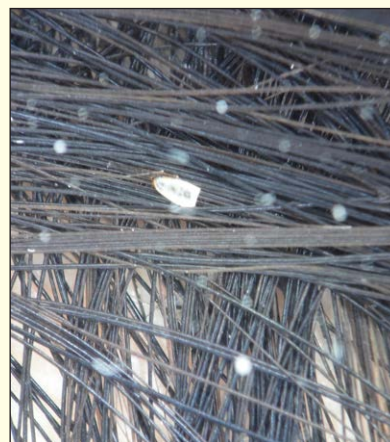


Figure 15: Trichoscopy of nits of pediculosis shows translucent pyriform structure that is snugly attached to the hair shaft.

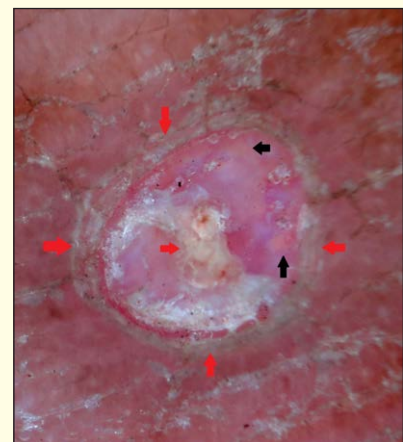


Figure 16: Dermoscopy of eumycotic mycetoma shows yellowish-orange structures (black arrows) which are suggestive of granuloma and white surface scales (red arrows).

5. Hair and scalp diseases lend themselves readily to dermoscopic examination and show distinct patterns in most cases narrowing down the clinical differential diagnoses. Dermoscopy of hair and scalp diseases is now termed as trichoscopy and is currently the most practiced area of dermoscopy in India. In addition, with appropriate software, this can make pre and post evaluation of hair transplant less cumbersome. Dermoscopy can confidently predict disease activity, e.g., active alopecia areata (AA) shows black dots, 'exclamation-mark' hairs, broken hairs, yellow dots and clustered short vellus hairs (figures 17, 18), whereas, in a treatment-responsive patch of AA, black dots tend to disappear, pig-tail, and upright regrowing hairs appear and yellow dots persist. Presence of background erythema is suggestive of disease activity in frontal fibrosing alopecia (FFA). Discoid lupus erythematosus (figure 19), lichen planopilaris (figure 20) and hair shaft diseases shows patterns characteristic of those diseases for example monilethrix shows uniform elliptical nodes with intermittent constrictions and bent regularly at multiple locations with a majority of broken hair.⁵

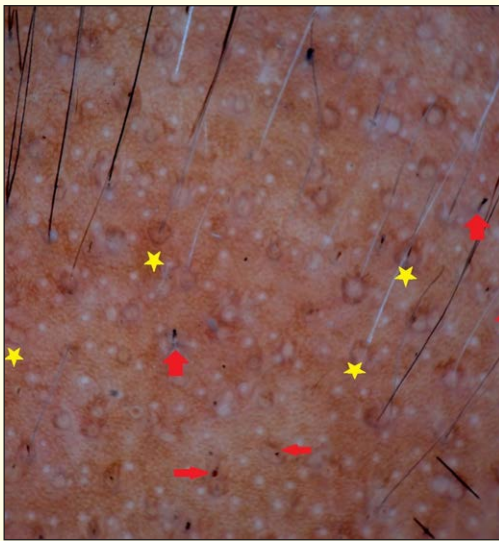


Figure 17: Trichoscopy of alopecia areata shows yellow dots (yellow stars), black dots (red arrows) and honeycomb pigment network.

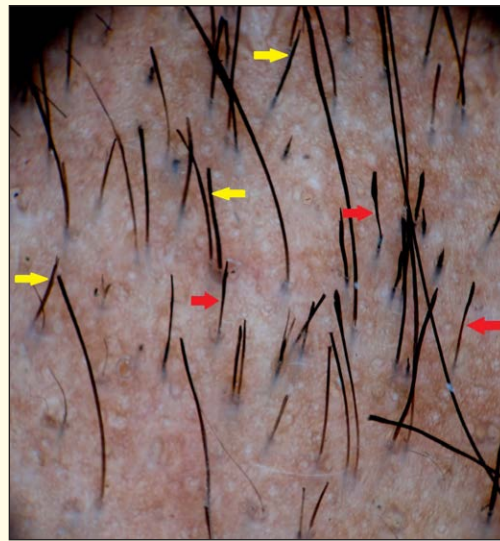


Figure 18: Trichoscopy of alopecia areata shows broken hairs (yellow arrows) and exclamation mark hairs (Red arrows).

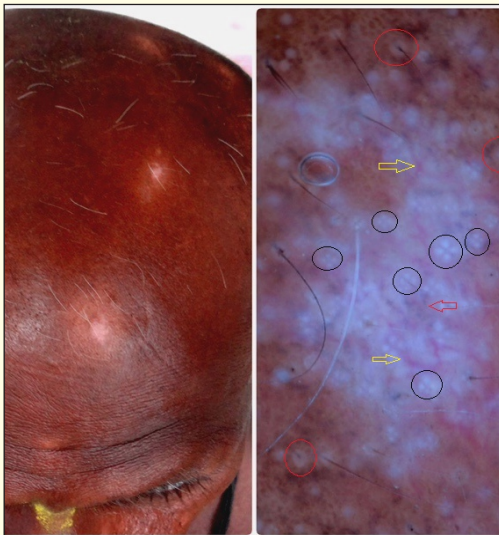


Figure 19: Dermoscopy of discoid lupus erythematosus demonstrates white rosette (black circles), telangiectasia (yellow arrows), blue-grey dots (red arrows) and patulous follicular openings (red circles) (right panel). Left panel shows clinical image.



Figure 20: Dermoscopy of lichen plano pilaris shows white dots (red stars), peripilar casts (black stars) and blue-grey dots around the follicular openings (yellow arrows) giving a targetoid pattern.

6. Dermoscopy has also been found useful for assessing vitiligo stability, an essential criterion for surgical intervention. Perifollicular depigmentation (PFD), marginal hyperpigmentation, and presence of leucotrichia are suggestive of lesional stability, while an altered pigment pattern, perifollicular pigment retention (PFP), and features such as star-burst appearance, comet tail sign, and ‘tapioca sago’ appearance are suggestive of disease activity. Thus Dermoscopy can also be used in assessing treatment response in various conditions including hair disorders and pigimentary disorders.⁶

7. It can also help in follow-up of treated cases of skin cancers. This application gains importance especially in the light of the steadily increasing availability and use of topical treatment options for non-melanoma skin cancer like photodynamic therapy for basal cell carcinoma. Also certain dermoscopic criteria, namely pigmented structures, ulceration and arborizing vessels, predict the presence of residual disease [residual disease-associated dermoscopic criteria (RDADC)] in skin tumors such as BCC.⁷

8. Disorders of the nails are also amenable to dermoscopic examination and this may at times obviate the need for a nail biopsy. Tosti found specific patterns for many nail disorders including pigmentation of nail plate. The term onychoscopy is used to denote dermoscopy of the nail and related structures. Hand-held dermoscopy can also be a useful tool in screening nail fold capillaries in the context of connective tissue diseases like scleroderma and dermatomyositis.⁸

9. The use of dermoscopy in cutaneous inflammatory diseases (inflammoscopy) is growing and studies around the world, especially in skin of color patients is helping to build a database of dermoscopy patterns under this group. A proposed “algorithm” for the dermoscopic examination of inflammatory diseases suggested four categories of criteria to be evaluated, namely vessel morphology and distribution, background color, surface scales or keratin and follicular disturbances, while additional clues that typify a specific diagnosis do also exist. Dermoscopy in common inflammatory dermatoses e.g. psoriasis vulgaris, usually presents with regularly distributed dotted vessels on a light or dull background (figure 21). When the presence of marked hyperkeratosis impedes the view of underlying features, scale removal may be useful to display the above-mentioned vascular pattern as well as possible tiny red blood drops (dermoscopic “Auspitz sign”) In lichen planus presence of characteristic whitish striae on dermoscopy (figure 22) can be observed whereas pityriasis rosea shows peripheral whitish scaling (“collarete” sign) as well as dotted vessels (figure 23), which, differently from psoriasis, are distributed in an irregular or focal pattern. Reactive perforating collagenosis shows a three zones consisting of a yellowish-brown hyperkeratotic plug in the center, elevated surrounded by an rim and pinkish halo at periphery. For general dermatological conditions Errichetti and Stinco have suggested classifying conditions based on gross morphological patterns - Dermatoses presenting with erythematous-desquamative patches plaques (like psoriasis), Papulosquamous—papulokeratotic dermatoses (like lichen planus), facial inflammatory skin diseases (like rosacea, lupus vulgaris, sarcoidosis, discoid lupus etc.) , acquired keratoderma, sclero-atrophic dermatosis (like morphea) , hypopigmented macular dermatosis, hyperpigmented maculo-papular diseases, itchy papulonodular lesions, erythrodermas, non-infectious balanitis, scaling scalp disorders, inflammatory cicatricial alopecia and non scarring alopecia.⁴

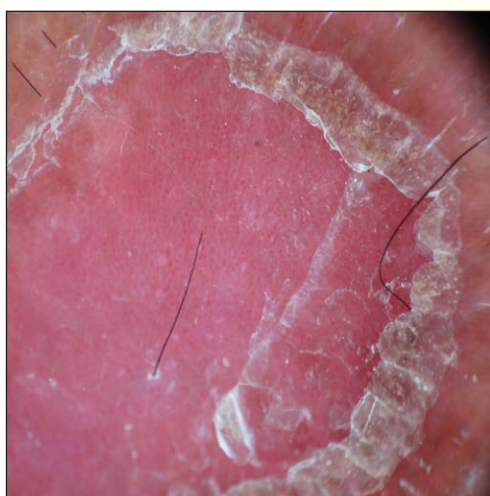


Figure 21: Dermoscopy of psoriasis shows regular red dots on the erythematous background.

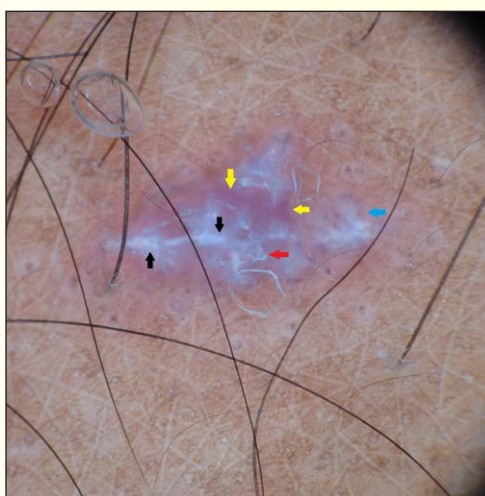


Figure 22: Dermoscopy of classical lichen planus shows Wickham striae (black arrows), white surface scales (red arrow), linear vessels (yellow arrows) and dotted vessels (blue arrow) at the periphery. Note the blue-grey background.

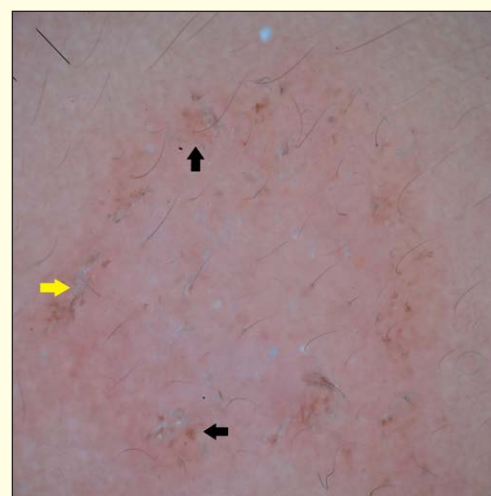


Figure 23: Dermoscopy of pityriasis rosea shows yellow-brown globules (black arrows) and white surface scales (yellow arrow).

10. Mucosal lesions are also amenable to dermoscopic examination (mucoscopy) and can help in the diagnosis of conditions like oral lichen planus.
11. Other miscellaneous uses of dermoscopy described recently include recognition and extraction of -foreign bodies in the skin.
12. Dermoscopy has also been found to help patients understand their skin condition better by using the dermoscopy images as a patient education tool. Above all it leads to a better doctor patient communication
13. Dermoscopic evaluation of peri-ocular hyperpigmentation can aid in identifying the predominant abnormality (skin pigmentation, abnormal vasculature, skin laxity) thereby helping in the development of customized treatment protocol.
14. Dermoscopy-based imaging system has recently been reported to be instrumental in the evaluation and categorization of ‘enlarged’ facial open pores. It plays a significant role in optimizing the outcome of laser hair reduction (LHR) and has been reported to be useful in monitoring the response to LHR in women. Laser parameters, especially pulse duration (that depends on the thickness of the hair being targeted) can be fine-tuned. Trichoscopy is being used mostly by hair transplant surgeons for various parameters at the donor and recipient area and in improving the outcome of trichology procedures like scalp micro –pigmentation.
15. Dermoscopy use in translational research: - Mutational studies that characterized nevi and melanomas based on dermoscopic pattern have shed light on the molecular underpinnings of nevi and melanomas.
16. Dermoscopy use in medical technologies: - Dermoscopy has facilitated the ongoing development and improvement of confocal laser microscopy, mobile teledermoscopy and videodermoscopy. The concept of Teledermoscopy also has potential implications for delivery of better skin care services in the developing world, where primary care physicians (PCPs) who are non-dermatologists cater to a large proportion of patients with cutaneous disorders.

To conclude, while dermoscopy continues to be used extensively for the primary indications it was initially used for (the diagnosis of pigmented skin tumors), it’s indications are growing in general dermatology. Evidence based development of guidelines are the need of the hour in the context of dermoscopy in general dermatology, especially in patients with skin of color. The future might see an increased correlation of dermoscopic findings to newer tools like confocal reflectance microscopy, further improving the diagnostic capabilities of the dermatologist. It is important that dermoscopic patterns always need to take in account the clinical context – clinical examination and history, and not in isolation.

Future perspective

Similar to the impact of the otoscope, ophthalmoscope and stethoscope in improving the bedside diagnosis of ear, eye and heart conditions, the dermatoscope will likely become a routinely used handheld tool for the examination of skin lesions and rashes

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