

REVIEW

Dermoscopy in General Dermatology: A Practical Overview

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ABSTRACT

Over the last few years, dermoscopy has been shown to be a useful tool in assisting the noninvasive diagnosis of various general dermatological disorders. In this article, we sought to provide an up-to-date practical overview on the use of dermoscopy in general dermatology by analysing the dermoscopic differential diagnosis of relatively common dermatological disorders grouped according to their clinical presentation, i.e. dermatoses presenting with erythematous-desquamative patches/plaques (plaque psoriasis, eczematous dermatitis, pityriasis rosea, mycosis fungoides and subacute cutaneous lupus erythematosus), papulosquamous/papulokeratotic dermatoses (lichen planus, pityriasis rosea, papulosquamous sarcoidosis, guttate psoriasis, pityriasis lichenoides chronica, classical

pityriasis rubra pilaris, porokeratosis, lymphomatoid papulosis, papulosquamous chronic GVHD, parakeratosis variegata, Grover disease, Darier disease and BRAF-inhibitor-induced acantholytic dyskeratosis), facial inflammatory skin diseases (rosacea, seborrheic dermatitis, discoid lupus erythematosus, sarcoidosis, cutaneous leishmaniasis, lupus vulgaris, granuloma faciale and demodicidosis), acquired keratodermas (chronic hand eczema, palmar psoriasis, keratoderma due to mycosis fungoides, keratoderma resulting from pityriasis rubra pilaris, tinea manuum, palmar lichen planus and aquagenic palmar keratoderma), sclero-atrophic dermatoses (necrobiosis lipoidica, morphea and cutaneous lichen sclerosis), hypopigmented macular diseases (extragenital guttate lichen sclerosus, achromic pityriasis versicolor, guttate vitiligo, idiopathic guttate hypomelanosis, progressive macular hypomelanosis and postinflammatory hypopigmentations), hyperpigmented maculopapular diseases (pityriasis versicolor, lichen planus pigmentosus, Gougerot-Carteaud syndrome, Dowling-Degos disease, erythema ab igne, macular amyloidosis, lichen amyloidosis,

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friction melanosis, terra firma-forme dermatosis, urticaria pigmentosa and telangiectasia macularis eruptiva perstans), itchy papulonodular dermatoses (hypertrophic lichen planus, prurigo nodularis, nodular scabies and acquired perforating dermatosis), erythrodermas (due to psoriasis, atopic dermatitis, mycosis fungoides, pityriasis rubra pilaris and scabies), noninfectious balanitis (Zoon's plasma cell balanitis, psoriatic balanitis, seborrheic dermatitis and non-specific balanitis) and erythroplasia of Queyrat, inflammatory cicatricial alopecias (scalp discoid lupus erythematosus, lichen planopilaris, frontal fibrosing alopecia and folliculitis decalvans), nonscarring alopecias (alopecia areata, trichotillomania, androgenetic alopecia and telogen effluvium) and scaling disorders of the scalp (tinea capitis, scalp psoriasis, seborrheic dermatitis and pityriasis amiantacea).

Keywords: Dermatitis; Dermatoscopy; Dermoscopy; Differential diagnosis; Inflammoscopy; Trichoscopy

INTRODUCTION

Over the last few years, several studies have shown that dermoscopy may come in very handy for assisting the noninvasive diagnosis of various general dermatological disorders [1–6], including scalp/hair diseases (trichoscopy) [7], nail/nailfold abnormalities (onychoscopy) [8], cutaneous infections/infestations (entomodermoscopy) [5] and inflammatory dermatoses (inflammoscopy) [1]. Indeed, such a technique provides additional information at a submacroscopic level that may help the dermatologist differentiate between two or more conditions that are hardly

distinguishable with the naked eye [1]. The most important criteria to be considered when using dermoscopy in general dermatology are: (1) the morphology/arrangement of vascular structures, (2) scaling patterns, (3) colours, (4) follicular abnormalities and (5) specific features (clues) [1, 2]. Obviously, dermoscopic findings must be interpreted within the overall clinical context of the patient (personal/family history, number, location, morphology and distribution of the lesions, etc.) because only the combination between such data can really enhance the diagnostic accuracy in the field of general dermatological disorders [1–6]. In fact, even though it has been demonstrated that some skin diseases may display “specific” dermoscopic criteria, there are others featuring just “nonspecific” findings, which may be considered useful only if coupled with proper and accurate clinical and anamnestic information [1–6]. Another crucial factor that must be taken into account in dermoscopic examination of most dermatoses is the choice of the equipment [1–6]. In particular, polarised light noncontact dermoscopy is usually preferred over conventional nonpolarised light contact dermoscopy as the latter may reduce the vessels (due to pressure) and/or scaling (when using a liquid interface) visibility, even though some clues are better seen with non-polarised light devices (i.e. more superficial findings, such as comedo-like structures) [1, 3].

The purpose of this article is to provide an up-to-date practical overview on the use of dermoscopy in general dermatology by analysing the dermoscopic differential diagnosis of several groups of relatively common dermatological disorders sharing the same (or similar) clinical presentation (erythematous-desquamative dermatoses, papulosquamous/papulokeratotic dermatoses, etc.) according to the available literature data

and our personal experience. All published information about the dermoscopy of the conditions considered in the present article was retrieved by a comprehensive search of the literature using the PubMed electronic database (including all publications describing at least one instance); the search terms were the names of the diseases and the words “epiluminescence microscopy”, “dermatoscopy” and “dermoscopy”. A manual search was also carried out by analysing the reference sections of all relevant studies or reviews about such a topic.

For each clinical category, we will first describe the diseases for which there is good evidence (if any) and afterwards mention those having weaker evidence, specifying the highest level of evidence available for each considered dermatosis, according to the most recent guidelines for evidence-based medicine, *The Oxford 2011 Levels of Evidence*: [9] level of evidence I, systematic review of cross sectional studies with consistently applied reference standard and blinding; II, individual cross sectional studies with consistently applied reference standard and blinding; III, non-consecutive studies or studies without consistently applied reference standards; IV, case-control studies or “poor or non-independent reference standard”; V, mechanism-based reasoning. All the retrieved studies were classified according to standard definitions for diagnostic accuracy studies [10–12]. Importantly, blinded cross-sectional studies not mentioning the sampling method (consecutive or non-consecutive) were considered as non-consecutive studies (level of evidence III), while case series studies (CSS), single case reports (SCR) and personal observations (PO) were labelled as level of evidence V. To be more accurate, we will also specify the information source type (CSS, SCR and/or PO) in case the level V turns out to be the best evidence available.

Tables 1, 2, 3, 4, 5 and 6 provide a summary of the dermoscopic clues of all the dermatological disorders considered, divided according to their clinical pattern.

The article is based on previously conducted studies and does not contain any new studies with human or animal subjects performed by any of the authors.

DERMATOSES PRESENTING WITH ERYTHEMATOUS-DESQUAMATIVE PATCHES/PLAQUES

Plaque Psoriasis (Level of Evidence: II)

Dermoscopy of plaque psoriasis typically shows a characteristic pattern consisting of diffuse white scales and symmetrically and regularly distributed dotted vessels on a light or dull red background (Fig. 1a) [13–24]. 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”) [21]. The “red globular ring” pattern is another less common (but specific) vascular pattern visible in plaque psoriasis lesions, while other patterns of vessel distribution are extremely rare [25].

Eczematous Dermatitis (Level of Evidence: II)

The most important dermoscopic features of eczematous dermatitis include dotted vessels in a patchy distribution and yellow serocrusts/scaling (Fig. 1b) [13, 26–28]. Focal whitish scales are sometimes visible, but they are always associated with the aforementioned “yellowish findings” [13, 26–28]. According to the disease stage, eczematous dermatitis may display some

Table 1 Summary of the dermoscopic clues of all the dermatological disorders considered, divided according to their clinical pattern (Part I)

Clinical pattern	Dermatoses presenting with erythematous-desquamative patches plaques (I)	Dermatoses presenting with erythematous-desquamative patches plaques (II)	Papulosquamous—papulokeratotic dermatoses (I)	Papulosquamous—papulokeratotic dermatoses (II)
Dermoscopic clues of each dermatosis	<p>Plaque psoriasis:</p> <ul style="list-style-type: none"> • White scales • Symmetrically and regularly distributed, dotted vessels on a light or dull red background <p>Eczematous dermatitis:</p> <ul style="list-style-type: none"> • Yellow serocrusts^a • Dotted vessels in a patchy distribution^b <p>Pityriasis rosea:</p> <ul style="list-style-type: none"> • Peripheral whitish scales (“collarette” sign) • Irregular or patchy dotted vessels 	<p>Mycosis fungoides:</p> <ul style="list-style-type: none"> • Orange-yellowish patchy areas • Linear vessels with or without red dots forming peculiar “spermatoozon-like” structures <p>Subacute cutaneous lupus erythematosus:</p> <ul style="list-style-type: none"> • Whitish scale • Mixed vascular pattern (at least two types among dotted, linear-irregular, linear and branching vessels) 	<p>Lichen planus:</p> <ul style="list-style-type: none"> • Wickham striae <p>Papulosquamous sarcoidosis:</p> <ul style="list-style-type: none"> • See “Facial inflammatory skin diseases (II)” <p>Pityriasis rosea:</p> <ul style="list-style-type: none"> • See “Dermatoses presenting with erythematous-desquamative patches plaques (I)” 	<p>Guttate psoriasis:</p> <ul style="list-style-type: none"> • Diffusely distributed dotted vessels <p>Pityriasis lichenoides chronica:</p> <ul style="list-style-type: none"> • Nondotted vessels • Focally distributed dotted vessels • Orange-yellowish structureless areas <p>Classic pityriasis rubra pilaris:</p> <ul style="list-style-type: none"> • Round/oval yellowish areas surrounded by linear dotted vessels • Central keratin plugs

^a More common in acute exudative lesions^b More common in chronic and lichenified lesions

Table 2 Summary of the dermoscopic clues of all the dermatological disorders considered, divided according to their clinical pattern (Part II)

Clinical pattern	Papulosquamous—papulokeratotic dermatoses (III)	Papulosquamous—papulokeratotic dermatoses (IV)	Facial inflammatory skin diseases (I)	Facial inflammatory skin diseases (II)
Dermoscopic clues of each dermatosis	<p>Disseminated forms of porokeratosis:</p> <ul style="list-style-type: none"> • Peripheral “cornoid lamella” <p>Lymphomatoid papulosis:</p> <ul style="list-style-type: none"> • Diffuse tortuous irregular (or dotted at low magnification) vessels (early lesions) • Central whitish-yellowish (hyperkeratotic lesions) or brown-grey (necrotic lesions) structureless area <p>Papulosquamous chronic GVHD:</p> <ul style="list-style-type: none"> • Whitish scales • Dotted and linear vessels 	<p>Poikiloderma vasculare atrophicans:</p> <ul style="list-style-type: none"> • Sparse whitish scales • Blurred branched vessels on a reddish/orangish background <p>Grover disease, Darier disease and BRAF-inhibitor-induced acantholytic dyskeratosis:</p> <ul style="list-style-type: none"> • Central star-shaped/branched polygonal/roundish-oval brownish area surrounded by a whitish halo^a 	<p>Rosacea:</p> <ul style="list-style-type: none"> • Linear vessels arranged in a polygonal network <p>Seborrheic dermatitis:</p> <ul style="list-style-type: none"> • Dotted vessels in a patchy distribution • Fine yellowish scales <p>Discoïd lupus erythematosus:</p> <ul style="list-style-type: none"> • Perifollicular whitish halo (early lesions) • Follicular keratotic plugs, red dots (early lesions) • White scaling (early lesions) • Whitish structureless areas (late lesions) • Blurred linear branching (late lesions) 	<p>Sarcoidosis, cutaneous leishmaniasis and lupus vulgaris:</p> <ul style="list-style-type: none"> • Diffuse or localised, structureless, orange yellowish areas • Focussed linear or branching vessels <p>Granuloma faciale:</p> <ul style="list-style-type: none"> • Dilated follicular openings • Linear branching vessels <p>Demodicidosis:</p> <ul style="list-style-type: none"> • “Demodex tails”^b • “Demodex follicular openings”^b

^a Grover disease (spongiotic variant) may also display whitish scaling over a reddish-yellowish background

^b “Demodex follicular openings” appear as round and coarse follicular openings containing light brown/greyish plugs surrounded by an erythematous halo, while “demodex follicular openings” appear as round and coarse follicular openings containing light brown/greyish plugs surrounded by an erythematous halo

Table 3 Summary of the dermoscopic clues of all the dermatological disorders considered, divided according to their clinical pattern (Part III)

Clinical pattern	Acquired keratodermas (I)	Acquired keratodermas (II)	Sclero-atrophic dermatoses	Hypopigmented macular diseases (I)
Dermoscopic clues of each dermatosis	<p>Palmar psoriasis:</p> <ul style="list-style-type: none"> • Diffuse white scaling <p>Chronic hand eczema:</p> <ul style="list-style-type: none"> • Brownish-orange dots/globules • Yellowish scales/crusts <p>Keratoderma due to mycosis fungoides:</p> <ul style="list-style-type: none"> • Relatively large, amber scales over a white-to-pinkish background <p>Keratoderma due to pityriasis rubra pilaris:</p> <ul style="list-style-type: none"> • Patchily distributed, homogeneous, structureless, orange areas 	<p>Tinea manuum:</p> <ul style="list-style-type: none"> • Whitish scales mainly localised in the creases <p>Palmar lichen planus:</p> <ul style="list-style-type: none"> • Roundish, yellowish areas often having peripheral projections <p>Aquagenic palmar keratoderma:</p> <ul style="list-style-type: none"> • Yellowish-whitish well-defined globules • Enlargement of the sweat duct pores 	<p>Morphea:</p> <ul style="list-style-type: none"> • Fibrotic beams <p>Lichen sclerosus:</p> <ul style="list-style-type: none"> • “Comedo-like openings” • Whitish patches <p>Necrobiosis lipoidica:</p> <ul style="list-style-type: none"> • Yellowish-orange/whitish-pinkish background • Comma-shaped (incipient lesions), network-shaped/hairpin-like (more developed lesions), or elongated, branching and focussed serpentine (advanced lesions) vessels 	<p>Extragenital guttate lichen sclerosus:</p> <ul style="list-style-type: none"> • See “Sclero-atrophic dermatoses” <p>Achromic pityriasis versicolor:</p> <ul style="list-style-type: none"> • Fairly demarcated white area. Fine scales in the skin furrows <p>Guttate vitiligo:</p> <ul style="list-style-type: none"> • Well-demarcated, dense/glowing, white area • Perifollicular hyperpigmentation

differences, with acute exudative lesions mainly showing yellow scale/crusts (“yellow clod sign”) and chronic and lichenified lesions predominantly displaying dotted vessels in a patchy distribution and scaling [1, 13, 29, 30].

Pityriasis Rosea (Level of Evidence: II)

Both the herald patch and the secondary lesions of pityriasis rosea typically show a characteristic peripheral whitish scaling (“collarette” sign) as

well as dotted vessels, which, differently from psoriasis, are distributed in an irregular or focal pattern; diffuse or localised yellowish-orange structureless areas may be visible as well (Fig. 1c) [13, 31, 32].

Mycosis Fungoides (Level of Evidence: III)

The most common dermoscopic aspect of mycosis fungoides consists of a combination of fine short linear vessels with

Table 4 Summary of the demoscopic clues of all the dermatological disorders considered, divided according to their clinical pattern (Part IV)

Clinical pattern	Hypopigmented macular diseases (II)	Hyperpigmented maculopapular diseases (I)	Hyperpigmented maculopapular diseases (II)	Hyperpigmented maculopapular diseases (III)
Dermoscopic clues of each dermatosis	<p>Idiopathic guttate hypomelanosis:</p> <ul style="list-style-type: none"> • “Cloudy sky-like” or “cloudy” pattern^a <p>Progressive macular hypomelanosis:</p> <ul style="list-style-type: none"> • Ill-defined whitish area without scaling <p>Postinflammatory hypopigmentation:</p> <ul style="list-style-type: none"> • Dermoscopic findings typical of the original lesions 	<p>Pityriasis versicolor:</p> <ul style="list-style-type: none"> • Fine whitish scaling • Pigmented network composed of brown stripes/diffuse brownish pigmentation <p>Lichen planus pigmentosus:</p> <ul style="list-style-type: none"> • Diffuse, structureless, brownish pigmentation • Fine/coarse, grey-blue/brown dots/globules <p>Confluent and reticulated papillomatosis (Gougerot-Carteaud syndrome):</p> <ul style="list-style-type: none"> • Fine whitish scaling • Brownish areas in a “cobblestone” or “sulci and gyri” pattern 	<p>Dowling-Degos disease:</p> <ul style="list-style-type: none"> • Brown star-like area/irregular brownish projections with a hypopigmented centre <p>Erythema ab igne (hyperpigmented stage):</p> <ul style="list-style-type: none"> • Diffuse brownish pigmentation • Telangiectatic vessels • Whitish scaling <p>Macular amyloidosis and lichen amyloidosis:</p> <ul style="list-style-type: none"> • White or brown central hub surrounded by various configurations of brownish pigmentation^b 	<p>Friction melanosis:</p> <ul style="list-style-type: none"> • Brownish structureless areas arranged in a reticular fashion <p>Terra firma-forme dermatosis:</p> <ul style="list-style-type: none"> • Large polygonal plate-like brown scales arranged in a mosaic pattern <p>Urticaria pigmentosa:</p> <ul style="list-style-type: none"> • Homogeneous light-brown blot and/or pigment network <p>Telangiectasia macularis eruptiva perstans:</p> <ul style="list-style-type: none"> • Reticular vessels on a erythematous or brownish base

^a The “cloudy sky-like” pattern consists of multiple small areas coalescing into irregular/porycyclic macules, with several white shades and both well- and ill-defined edges, surrounded by patchy hyperpigmented network, while the “cloudy” pattern consists of well or ill-defined roundish homogeneous whitish areas surrounded by patchy hyperpigmented network

^b In lichen amyloidosis the central hub may be replaced by a scar-like area

orange-yellowish patchy areas (Fig. 1d) [33]; a peculiar vascular structure resembling spermatozoa (composed of a dotted and a short curved linear vessel) is also quite frequently visible [33]. Additional dermoscopic features are represented by fine white scaling, dotted vessels and purpuric dots [33].

Subacute Cutaneous Lupus erythematosus (Level of Evidence: V—CSS)

Subacute cutaneous lupus erythematosus is characterised by two constant dermoscopic findings, namely whitish scales (diffusely or

Table 5 Summary of The dermoscopic clues of all the dermatological disorders considered, divided according to their clinical pattern (Part V)

Clinical pattern	Itchy papulonodular dermatoses	Erythrodermas (I)	Erythrodermas (II)	Noninfectious balanitis—erythroplasia of Queyrat
Dermoscopic clues of each dermatosis	<p>Hypertrophic lichen planus:</p> <ul style="list-style-type: none"> • Rippled surface • “Comedo-like” structures • Round corneal structures (“corn pearls”) <p>Prurigo nodularis:</p> <ul style="list-style-type: none"> • “White starburst” pattern^a <p>Nodular scabies:</p> <ul style="list-style-type: none"> • Mites (“hang glider sign”) • Burrows (“jet with condensation trails”) <p>Acquired perforating dermatosis:</p> <ul style="list-style-type: none"> • Three concentric areas with different aspect/colour 	<p>Erythrodermic psoriasis:</p> <ul style="list-style-type: none"> • Diffusely distributed whitish scales • Regularly arranged dotted/glomerular vessels <p>Erythrodermic atopic dermatitis:</p> <ul style="list-style-type: none"> • Yellowish scales/sero crusts • Patchily distributed dotted vessels <p>Erythrodermic mycosis fungoides:</p> <ul style="list-style-type: none"> • Linear vessels (including spermatozoon-like vessels) and dotted vessels 	<p>Erythrodermic pityriasis rubra pilaris:</p> <ul style="list-style-type: none"> • Orange blotches • Islands of nonerythematous (spared) skin displaying reticular vessels <p>Erythrodermic scabies:</p> <ul style="list-style-type: none"> • Dark-brown triangular structures located at the end of whitish structureless wavy lines (delta-wing jets with contrail) 	<p>Zoon’s plasma cell balanitis:</p> <ul style="list-style-type: none"> • Focal/diffuse orange-yellowish structureless areas • Fairly focussed curved vessels (including serpentine, convoluted and chalice-shaped) <p>Psoriatic balanitis:</p> <ul style="list-style-type: none"> • Regularly distributed dotted/glomerular vessels <p>Seborrheic dermatitis and non-specific balanitis:</p> <ul style="list-style-type: none"> • Linear irregular unspecific blurry vessels <p>Erythroplasia of Queyrat:</p> <ul style="list-style-type: none"> • Scattered glomerular vessels

^a Consists of radially arranged whitish lines or a peripheral whitish halo with some centrifugal coarse projections on a brownish and/or reddish background, which may surround brown-reddish/brown-yellowish crust(s), erosion(s) and/or hyperkeratosis/scales

peripherally distributed) and a mixed vascular pattern (at least two types of vessels among dotted, linear-irregular, linear and branching

vessels) over a pinkish-reddish background [34]. Focally distributed orange-yellowish structureless areas may also be seen less commonly [34].

Table 6 Summary of the dermoscopic clues of all the dermatological disorders considered, divided according to their clinical pattern (Part VI)

Clinical pattern	Inflammatory cicatricial alopecia	Nonscarring alopecias	Scaling disorders of the scalp
Dermoscopic clues of each dermatosis	<p>Inflammatory cicatricial alopecia</p> <p>Discoid lupus erythematosus:</p> <ul style="list-style-type: none"> • Follicular keratonic plugs, thick arborising vessels and red dots (acute lesions) • Thin arborising vessels emerging from yellow dots (late lesions) • White areas and branching vessels (long-lasting lesions) <p>Lichen planopilaris:</p> <ul style="list-style-type: none"> • Perifollicular scales <p>Frontal fibrosing alopecia:</p> <ul style="list-style-type: none"> • Minor perifollicular scaling • Lonely hair/predominance of follicular openings with only one hair at the hair-bearing margin <p>Folliculitis decalvans:</p> <ul style="list-style-type: none"> • Follicular pustules • Yellow discharge/crusts • Hair tufts that contain >10 hairs <p>Shafts</p>	<p>Nonscarring alopecias</p> <p>Alopecia areata:</p> <ul style="list-style-type: none"> • Black dots, micro-exclamation mark hairs, broken hairs, tapered hairs, monilethrix-like hairs and trichorrhexis nodosa (acute forms) • Regular yellow dots (inactive lesions); • Circle and/or pigtail hairs (regrowing phases) <p>Trichotillomania:</p> <ul style="list-style-type: none"> • Hairs broken at different lengths • Short hairs with trichoptilosis (“split ends”) • Other: irregular coiled hairs, amorphous hair residues, black dots, flame-like hairs, tulip-like hairs and V-sign^a <p>Androgenetic alopecia:</p> <ul style="list-style-type: none"> • Hair shaft thickness heterogeneity • Increased proportion of thin and vellus hairs (>10 % of the hairs) <p>Telogen effluvium:</p> <ul style="list-style-type: none"> • Lack of features typical of other diseases^b 	<p>Scaling disorders of the scalp</p> <p>Tinea capitis:</p> <ul style="list-style-type: none"> • “Comma” hair, “corkscrew” hair, “zigzag” hair and “Morse code” hair <p>Scalp psoriasis:</p> <ul style="list-style-type: none"> • Red dots/globules • Signet ring vessels, red loops, white scales, punctate hemorrhages and hidden hairs (with a lower specificity) <p>Seborrheic dermatitis:</p> <ul style="list-style-type: none"> • Arborizing vessels • Yellowish scaling, structureless red areas, honeycomb pigment and comma vessels (with a lower specificity) <p>Pityriasis amiantacea:</p> <ul style="list-style-type: none"> • Compact white keratotic material adhering to a tuft of hair (asbestos-like scale)

^a Two or more hairs emerging from one follicular unit that are broken at the same level

^b Common, but nonspecific, findings include the presence of empty hair follicles, a predominance of follicular units with only one hair, perifollicular discoloration (the peripilar sign), upright regrowing hairs (mainly acute forms) and progressive uniform hair thinning (chrome forms). Importantly, there is no significant difference between the findings in the frontal area and those in the occipital area, which differentiates telogen effluvium from androgenetic alopecia

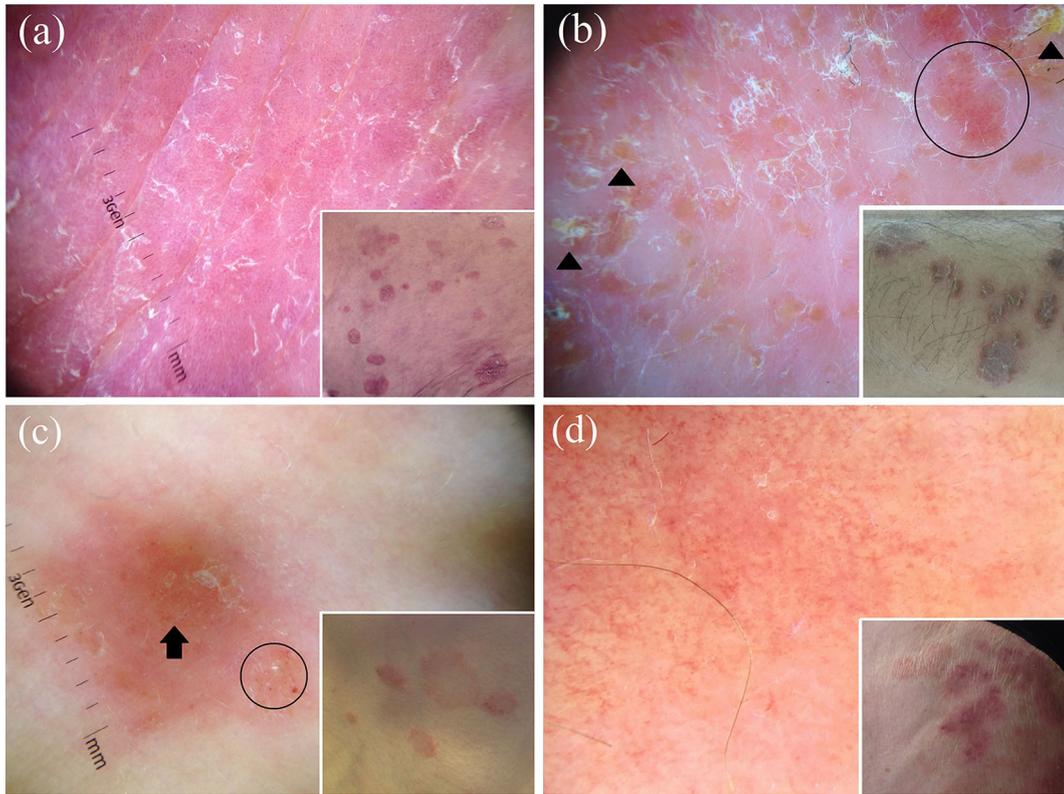


Fig. 1 Dermoscopy of plaque psoriasis typically shows white scales and symmetrically and regularly distributed dotted vessels on a red background (a). The main dermoscopic criteria in eczematous dermatitis are dotted vessels (black circle) in a patchy distribution and yellow serocrusts (black arrowhead) (b). Both the herald patch and the secondary lesions of pityriasis rosea are

dermoscopically characterised by peculiar peripheral whitish scales (“collarette” sign) as well as irregular or patchy dotted vessels (black circle); structureless orangish areas are also visible (black arrow) (c). Dermoscopic examination of mycosis fungoides reveals a combination of fine short, linear vessels with orange-yellowish patchy areas (d)

PAPULOSQUAMOUS/ PAPULOKERATOTIC DERMATOSES

Classical Lichen Planus (Level of Evidence: II)

The dermoscopic hallmark of classical lichen planus is represented by Wickham striae (Fig. 2a), which may appear as pearly-whitish (and less commonly yellow or blue-white) structures possibly displaying several morphological patterns, including reticular (the most common), linear, “radial streaming”, annular, round, “leaf venation”

(delicate secondary striae branching from the centred whitish venation, linked together at either end, mimicking the crystal structure of snow) and “starry sky” (clustered, follicular white dots) aspect [13–15, 35–39]. Dotted, globular and/or linear vessels, mainly localised at the periphery of the lesion (and less commonly showing a perifollicular or diffuse pattern), violet, reddish, pink, brown or yellow background, white/yellow dots and some pigmented structures (dots, globules and/or reticular or cloud-like areas) are other additional dermoscopic findings of active lesions [13–15, 35–39].

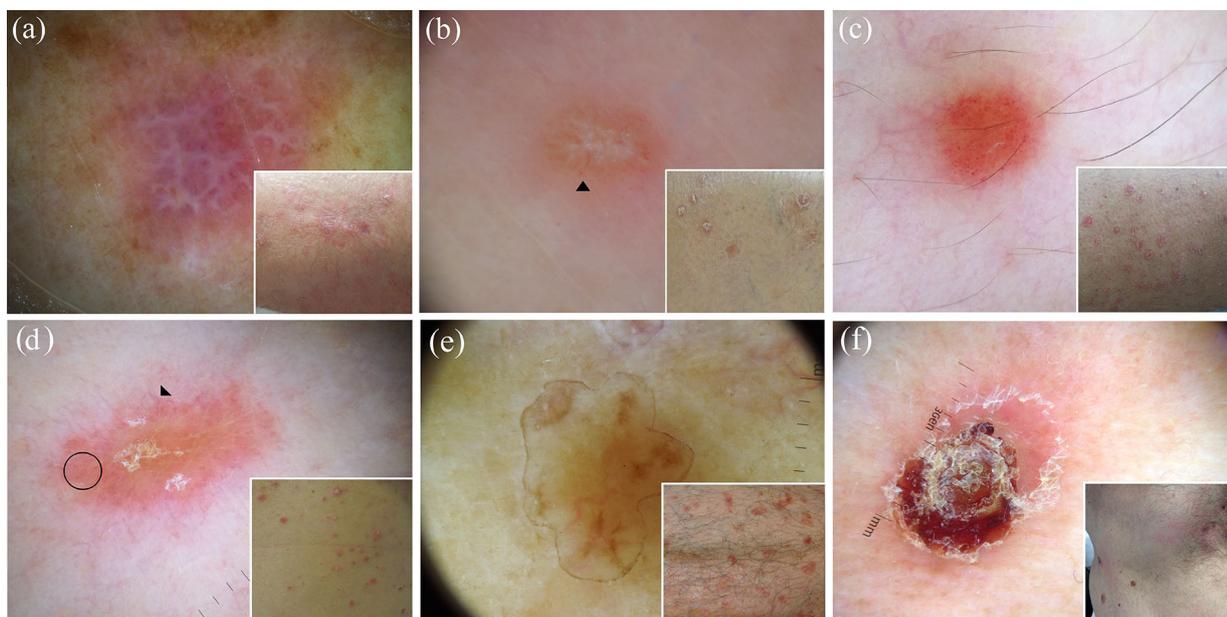


Fig. 2 The dermoscopic analysis of classical lichen planus typically shows the Wickham striae over a purplish background (a). Dermoscopy of papulosquamous sarcoidosis shows the characteristic orange-yellowish background, in combination with in-focus fine linear vessels (black arrowhead); whitish lines and white scales are also evident in the centre (b). Guttate psoriasis lesions typically show a distinctive monomorphic dermoscopic picture, with dotted vessels distributed in a diffuse pattern (c). Dermoscopy of

pityriasis lichenoides chronica frequently displays nondotted vessels, e.g. linear irregular vessels (black arrowhead), focally distributed dotted vessels (black circle) and orange-yellowish structureless areas (d). Dermoscopic examination of a case of disseminated superficial actinic porokeratosis displays the peculiar “cornoid lamella” at the periphery of the lesion (e). Dermoscopy of a necrotic lesion of lymphomatoid papulosis shows a central brown-grey structureless area (f)

Pityriasis Rosea (Level of Evidence: II)

See the section “[Dermatoses presenting with erythematous-desquamative patches/plaques](#)”.

Papulosquamous Sarcoidosis (Level of Evidence: II)

See the section “[Common facial inflammatory skin diseases](#)” (Fig. 2b).

Guttate Psoriasis (Level of Evidence: III)

Guttate psoriasis classically displays a distinctive monomorphic dermoscopic aspect consisting of dotted vessels regularly distributed

all over the lesion, which are often associated with whitish scales (Fig. 2c) [1, 40], similarly to that seen in plaque-type psoriasis [1–6, 41]; orange-yellowish structureless areas may also be present, but they are quite uncommon [40].

Pityriasis Lichenoides Chronica (Level of Evidence: III)

The most peculiar dermoscopic findings of pityriasis lichenoides chronica include nondotted vessels (i.e. milky red areas/globules, linear irregular and branching vessels), focally distributed dotted vessels and orange-yellowish structureless areas (Fig. 2d) [40]. Interestingly, whitish areas may

sometimes be present in the context of clinically active lesions as a result of focal post-inflammatory hypopigmentation [1, 40].

Classical Pityriasis Rubra Pilaris (Level of Evidence: V—CSS, CR)

Dermoscopy of classical pityriasis rubra pilaris papules may show round/oval yellowish areas surrounded by vessels of mixed morphology, namely linear and dotted [1, 16]. Additionally, central keratin plugs may also be observed [1].

Disseminated Forms of Porokeratosis (Level of Evidence: V—CSS, CR)

The most peculiar dermoscopic feature of all variants of porokeratosis is the “cornoid lamella”, which appears as a well-defined, thin, white-yellowish, annular peripheral hyperkeratotic structure (“white track”) similar to the outlines of a volcanic crater as observed from a high point, which may be hyperpigmented in disseminated superficial actinic porokeratosis (Fig. 2e); the centre of the lesions is usually whitish or brownish and may exhibit circular and/or linear whitish and/or hyperpigmented tracks, blue-grey dots and dotted, linear or globular vessels (Fig. 2e) [17, 42–49].

Lymphomatoid Papulosis (Level of Evidence: V—CSS)

Dermoscopic pattern of lymphomatoid papulosis varies according to the disease stage. The initial inflammatory papules usually display a vascular pattern of tortuous irregular (or dotted at low magnification) vessels, surrounded by white structureless areas,

radiating from the centre to the periphery of the lesion, while in more mature papules, such a vascular pattern is less evident and generally detectable only at the periphery of the lesion as the centre is occupied by a whitish-yellowish (hyperkeratotic lesions) or brown-grey (necrotic lesions) structureless area (Fig. 2f) [50].

Papulosquamous Chronic GVHD (Level of Evidence: V—CSS)

The dermoscopic aspect of papulosquamous chronic GVHD consists of whitish scales associated with vessels of mixed morphology, namely dotted and linear [1]. Although such a pattern is quite unspecific, it might be useful in assisting the clinical differential diagnosis with the other above-mentioned papulosquamous disorders as they typically show a different appearance [1].

Poikiloderma Vasculare Atrophicans/ Parakeratosis Variegata (Level of Evidence: V—CSS)

This condition typically shows a monomorphic pattern consisting of relatively blurred branched vessels on a reddish or orangish-brown background, associated with sparse whitish scales [51].

Acantholytic and Dyskeratotic Papular Disorders (Grover Disease, Darier Disease and BRAF-Inhibitor-Induced Acantholytic Dyskeratosis; Level of Evidence: V—CSS, CR)

Grover disease may display different features according to the histological subtype, with a central star-shaped/branched polygonal/roundish-oval brownish area surrounded by a

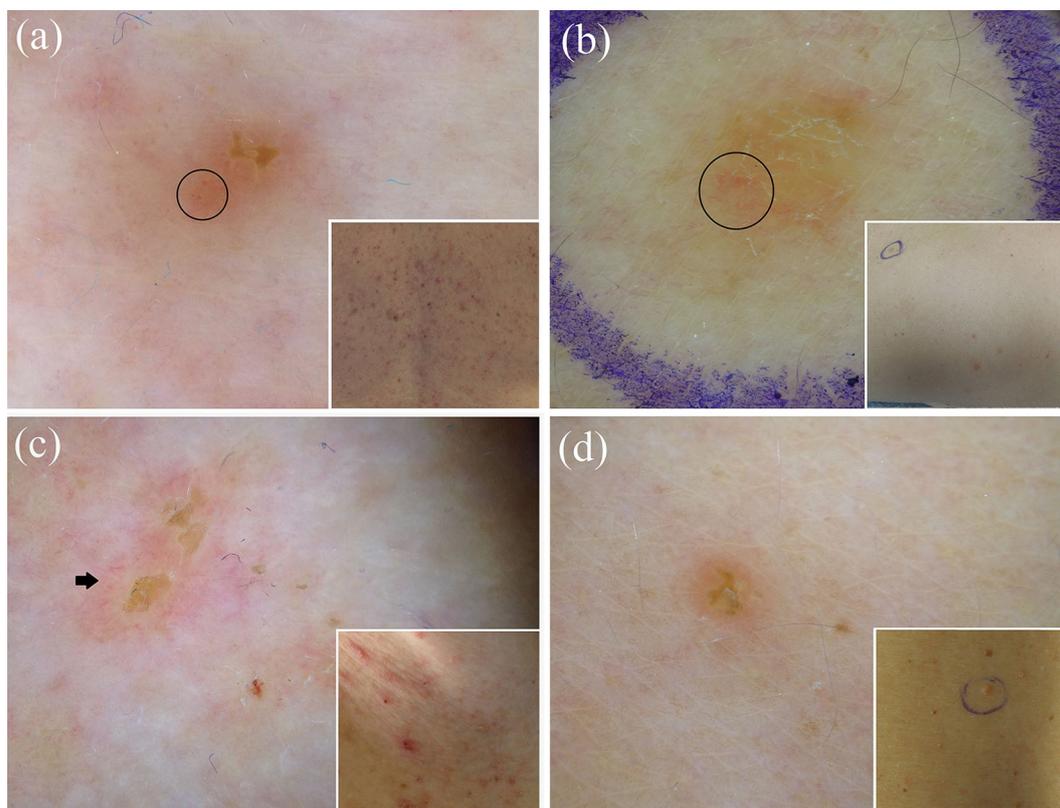


Fig. 3 Dermoscopy of Darier-like Grover disease displays a central branched polygonal brownish area surrounded by a thin whitish halo with peripheral dotted vessels (black circle) (a), while spongiotic Grover disease presents with whitish scaling over a reddish-yellowish background and irregular vessels (black circle) (b). Dermoscopic examination of Darier disease (c) and BRAF-inhibitor-induced

acantholytic dyskeratosis (d) shows a pattern similar to that observed in Darier-like Grover disease, with a centrally located polygonal brownish area surrounded by a whitish halo and linear vessels (black arrow) in Darier disease (c) and a central branched polygonal brownish area surrounded by a thin whitish halo in the latter condition (d)

whitish halo being characteristic of the Darier-like histological subtype (Fig. 3a) and whitish scaling over a reddish-yellowish background being characteristic of the spongiotic histological subtype (Fig. 3b); dotted and/or linear/irregular vessels may be found in both such forms (Fig. 3a, b) [52–55]. Importantly, the dermoscopic pattern of Darier-like Grover disease overlaps with that detectable in both Darier disease and BRAF-inhibitor-induced acantholytic dyskeratosis (Fig. 3c, d) [55–58].

COMMON FACIAL INFLAMMATORY SKIN DISEASES

Rosacea (Level of Evidence: III)

The dermoscopic hallmark of rosacea is represented by the presence of linear vessels characteristically arranged in a polygonal network (vascular polygons) [26, 59] (Fig. 4a). Additional features include rosettes [60], follicular plugs, white/yellowish scales, orange-yellowish areas, pigmentation

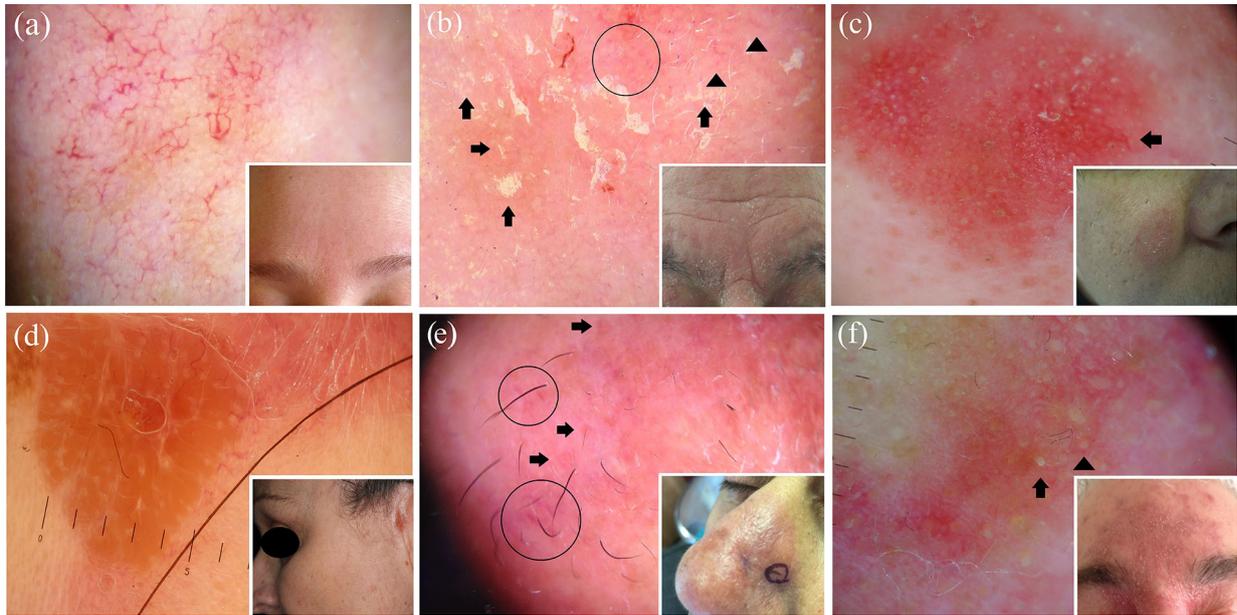


Fig. 4 The main dermoscopic feature of rosacea is the presence of linear vessels, which are characteristically arranged in a polygonal network (a). The most typical dermoscopic finding of seborrheic dermatitis is represented by the presence of dotted vessels in a patchy distribution (black circle) and yellowish scales (black arrows); blurry linear branching vessels (black arrowheads) and whitish scales are also not uncommonly present (b). Dermoscopy of an intermediate-stage lesion of facial discoid lupus erythematosus reveals follicular white/yellowish rings/keratotic plugs, whitish scaling and blurred branching vessels (black arrow) over a reddish background (c).

Dermoscopy of facial sarcoidosis displays a structureless orange-yellowish background with focussed linear vessels (d), while granuloma faciale features dilated follicular openings (black arrows) associated with linear/branching vessels (black circles) over a pinkish background (e). Dermoscopy of demodicidosis shows the so-called “Demodex tails”, which are visualised as creamy/whitish gelatinous threads protruding out of follicular openings (black arrow), and “Demodex follicular openings”, which appear as round and coarse follicular openings containing light brown/greyish plugs surrounded by an erythematous halo (black arrowhead) (f)

structures, dilated follicles and follicular pustules (papulopustular rosacea) [26, 59].

Seborrheic Dermatitis (Level of Evidence: III)

The most typical dermoscopic findings of seborrheic dermatitis include dotted vessels in a patchy distribution and fine yellowish scales (in combination or not with white scales) (Fig. 4b); follicular plugs, orange-yellowish areas, whitish structureless areas and linear branching vessels are less common features [26].

Discoid Lupus erythematosus (Level of Evidence: III)

Dermoscopy of facial (and extra-scalp in general) discoid lupus erythematosus shows different features according to the stage of disease, with erythema, perifollicular whitish halo, follicular keratotic plugs, red dots and white scaling being the most common/characteristic features of early lesions, and whitish structureless areas, hyperpigmentation (honeycomb network, perifollicular pigmentation, radial pigment streaks or pigmentation arranged in unspecified pattern) and blurred telangiectasias (mainly

linear branching vessels and less commonly dotted/polymorphous vessels) representing the most frequent findings of late phases [26, 61–65]; intermediate-stage lesions may display a mixture of the aforementioned features (Fig. 4c) [26, 61–65]. Less common dermoscopic findings include diffuse hyperkeratosis (hypertrophic discoid lupus erythematosus) [65], dilated follicles and yellowish scales [26, 61–65].

Granulomatous Skin Diseases (Sarcoidosis, Cutaneous Leishmaniasis and Lupus Vulgaris; Level of Evidence: III)

The dermoscopic signature of all these granulomatous facial dermatoses consists of structureless orange-yellowish areas (diffuse or localised—often described as “grains of sand” in lupus vulgaris and teardrop-like areas in leishmaniasis), commonly associated with focussed linear or branching vessels (Fig. 4d) [26, 66–80]. Other possible findings include milia-like cysts, erythema, whitish lines or structureless areas, follicular plugs, dilated follicles, pigmentation structures, and white and/or yellow scales [26, 66–80]. Additionally, leishmaniasis has been reported to show hyperkeratosis, further vascular features (hairpin, comma-shaped, glomerular-like and/or corkscrew vessels), central ulcerations and white peripheral projections (white starburst pattern) [73–80]. Nevertheless, dermoscopy may not be considered as a reliable tool in differentiating such granulomatous diseases and therefore histological assessment is needed to reach a definitive diagnosis [26, 66–80].

Granuloma Faciale (Level of Evidence: III)

The dermoscopic hallmark of granuloma faciale is represented by the presence of dilated follicular openings associated with linear branching

vessels (which sometimes appear as focussed elongated telangiectasias) over a pinkish background (Fig. 4e) [26, 81–83]; additional findings include perifollicular whitish halo, whitish streaks, follicular plugs, yellowish scales and pigmentation structures [26, 81–83].

Demodicidosis (Level of Evidence: V—CSS)

The most indicative dermoscopic features of all types of demodicidosis are the so-called “Demodex tails”, which are creamy/whitish gelatinous threads (representing the presence of the mite itself under magnification) protruding out of follicular openings, and “Demodex follicular openings”, which appear as round and coarse follicular openings containing light brown/greyish plugs surrounded by an erythematous halo (Fig. 4f) [84]. Other unspecific dermoscopic findings (whose prevalence varies according to the subtypes of demodicidosis) include diffuse erythema, scaling, pustules and reticular dilated vessels [84].

ACQUIRED KERATODERMAS

Chronic Hand Eczema (Level of Evidence: III)

The most specific dermoscopic features of chronic hand eczema include brownish-orange dots/globules (corresponding to tiny spongiotic vesicles), yellowish scales and yellowish-orange crusts [28, 85]; other less common findings are focally distributed whitish scaling and dotted vessels (Fig. 5a) [28, 85].

Palmar Psoriasis (Level of Evidence: III)

The main dermoscopic finding of palmar psoriasis is represented by the presence of

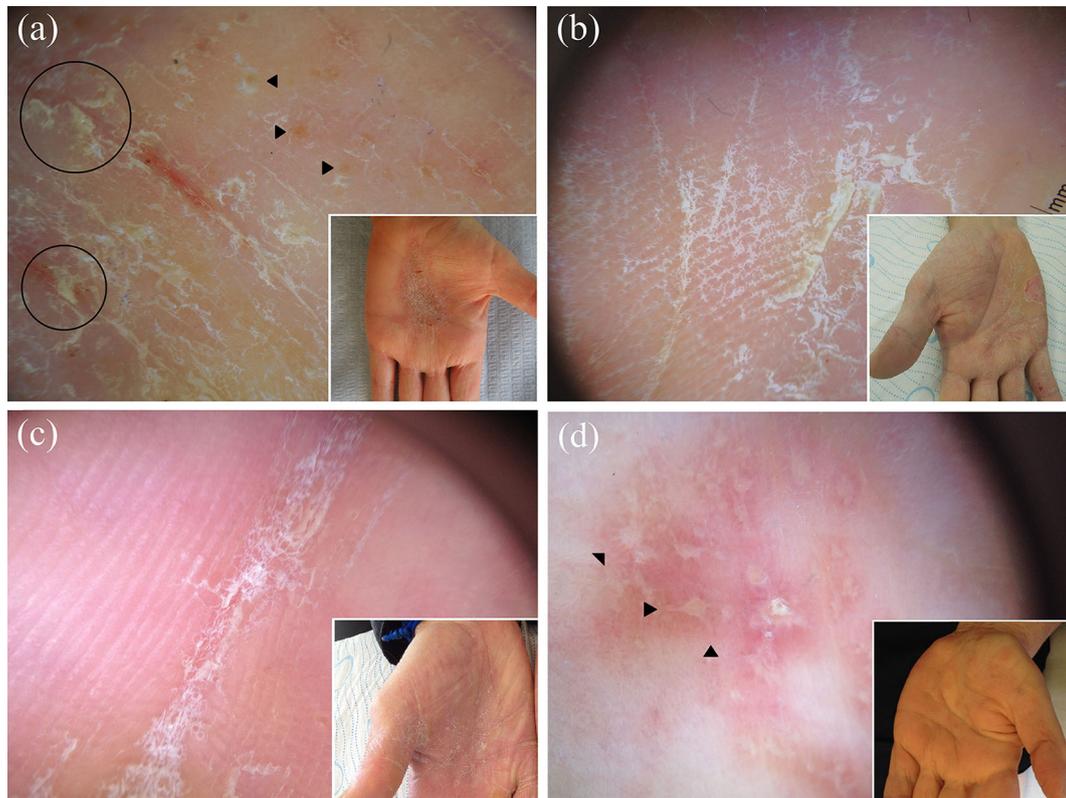


Fig. 5 Dermoscopy of chronic hand eczema typically reveals sparse whitish scales, yellowish scaling (black circles) and orangish dots/globules (black arrowheads), while palmar psoriasis and tinea manuum respectively display diffuse white scaling (b) and white scales mainly

localised in the skin furrows (c). Dermoscopic examination of a case of palmar lichen planus shows roundish yellowish areas, some of which display peripheral projections in a star-like appearance (black arrowheads) over a purplish background (d)

white scales typically distributed in a diffuse pattern (and only infrequently showing patchily or central distribution) (Fig. 5b) [23, 28, 85]. Dotted vessels, which are regularly distributed (and only rarely in rings or patchy-distributed), may also be visible quite commonly when using a fluid interface (which reduce the scaling) [23]; focal yellowish scales are an additional but very rare finding [23, 28].

Keratoderma due to Mycosis Fungoides (Level of Evidence: V—CR)

The most characteristic dermoscopic finding of keratoderma due to mycosis fungoides consists

of relatively large amber scales over a white-to-pinkish background; sparse whitish scales and several non-specific reddish fissures are also visible [85].

Keratoderma due to Pityriasis Rubra Pilaris (Level of Evidence: V—CR)

The dermoscopic hallmark of keratoderma resulting from pityriasis rubra pilaris is the presence of patchily distributed, homogeneous, structureless orange areas presenting different sizes; unspecific whitish scaling may also be observed [85].

Tinea Manuum (Level of Evidence: V—PO)

From a dermoscopic point of view, tinea manuum displays whitish scaling distributed in a characteristic pattern, i.e. mainly localised in the physiologic palmar creases (Fig. 5c) (personal observations).

Palmar Lichen Planus (Level of Evidence: V—PO)

Palmar lichen planus is typically characterised by roundish yellowish areas often having peripheral projections that may create a star-like appearance; a purplish background is sometimes visible (Fig. 5d) (personal observations).

Aquagenic Palmar Keratoderma (Level of Evidence: V—CR)

Dermoscopy of aquagenic palmar keratoderma shows large yellow well-defined globules not affecting dermatoglyphs [86] or simply enlargement of the sweat duct pores when compared with a normal-looking palmar skin area [87, 88].

SCLERO-ATROPHIC DERMATOSES

Necrobiosis Lipoidica (Level of Evidence: III)

Dermoscopy of necrobiosis lipoidica lesions typically shows comma-shaped (incipient lesions), network-shaped/hairpin-like (more developed lesions) or elongated, branching and focussed serpentine (advanced lesions) vessels over a yellowish-orange/whitish-pinkish background (with or without reddish areas) (Fig. 6a) [89–93]. Additional findings include patchy pigmented reticulum, yellow crusting and ulceration [89–93].

Morphea (Level of Evidence: IV)

The most specific dermoscopic feature of morphea consists of whitish fibrotic beams, which are frequently crossed by linear branching vessels (Fig. 6b) [94–96]; pigment network-like structures are also often evident, while “comedo-like openings” and whitish patches are less commonly seen [94–96].



Fig. 6 Dermoscopic examination of an advanced lesion of necrobiosis lipoidica reveals elongated, branching and focussed serpentine vessels over a yellowish-orange/whitish background (a). Dermoscopy of morphea shows the typical fibrotic beams (black arrows) associated with linear

branching vessels (b), while cutaneous lichen sclerosis displays several “comedo-like openings” (follicular keratotic plugs), whitish patches, dotted vessels (black circle) and delicate linear branching vessels (c)

Cutaneous Lichen Sclerosus (Level of Evidence: IV)

The dermoscopic hallmarks of cutaneous lichen sclerosis include “comedo-like openings” (follicular keratotic plugs) and whitish patches (Fig. 6c) [94, 95, 97–100]; less common/less specific findings are represented by delicate linear branching vessels, fibrotic beams, grey dots, purpuric spots, pigment network-like structures, non-branching vessels (comma-like, hairpin and/or dotted), fine whitish scaling and chrysalis structures [94, 95, 97–100].

HYPOPIGMENTED MACULAR DISEASES

Extragenital Guttate Lichen Sclerosus (Level of Evidence: IV)

See the section “[Sclero-atrophic dermatoses](#)”.

Achromic Pityriasis Versicolor (Level of Evidence: V—PO)

Dermoscopy of achromic/hypochromic lesions of pityriasis versicolor usually shows a fairly demarcated white area with fine scales that are commonly localised in the skin furrows (Fig. 7a), similarly to hyperpigmented lesions [101].

Guttate Vitiligo (Level of Evidence: V—CSS)

The most common/typical dermoscopic features of guttate vitiligo include a well-demarcated, dense/glowing, white area and perifollicular hyperpigmentation (which is more frequently seen in repigmenting or

progressing lesions than stable lesions) (Fig. 7b) [102–104]. Other possible findings include perilesional hyperpigmentation, a reversed pigmentary network, reticular pigmentation and telangiectasias [102–104].

Idiopathic Guttate Hypomelanosis (Level of Evidence: V—CSS)

Dermoscopic examination of idiopathic guttate hypomelanosis displays two main aspects, i.e. the “cloudy sky-like” pattern (multiple small areas coalescing into irregular/polycyclic macules, with several white shades and both well- and ill-defined edges, surrounded by patchy hyperpigmented network) and the “cloudy” pattern (well or ill-defined roundish homogeneous whitish areas surrounded by patchy hyperpigmented network) (Fig. 7c) [101, 105].

Progressive Macular Hypomelanosis (Level of Evidence: V—PO)

Progressive macular hypomelanosis is dermoscopically characterised by an ill-defined whitish area without scaling [101].

Postinflammatory Hypopigmentation (Level of Evidence: V—CSS, PO)

Postinflammatory macular hypopigmentations often present some dermoscopic findings typical of the original lesions, e.g. non-dotted vessels/orangish structureless areas in pityriasis lichenoides [1, 40], dotted vessels in guttate psoriasis [1, 40] and star-like depigmentation in prurigo nodularis [103] (Fig. 7d), thereby assisting the retrospective diagnosis [1, 40, 106].

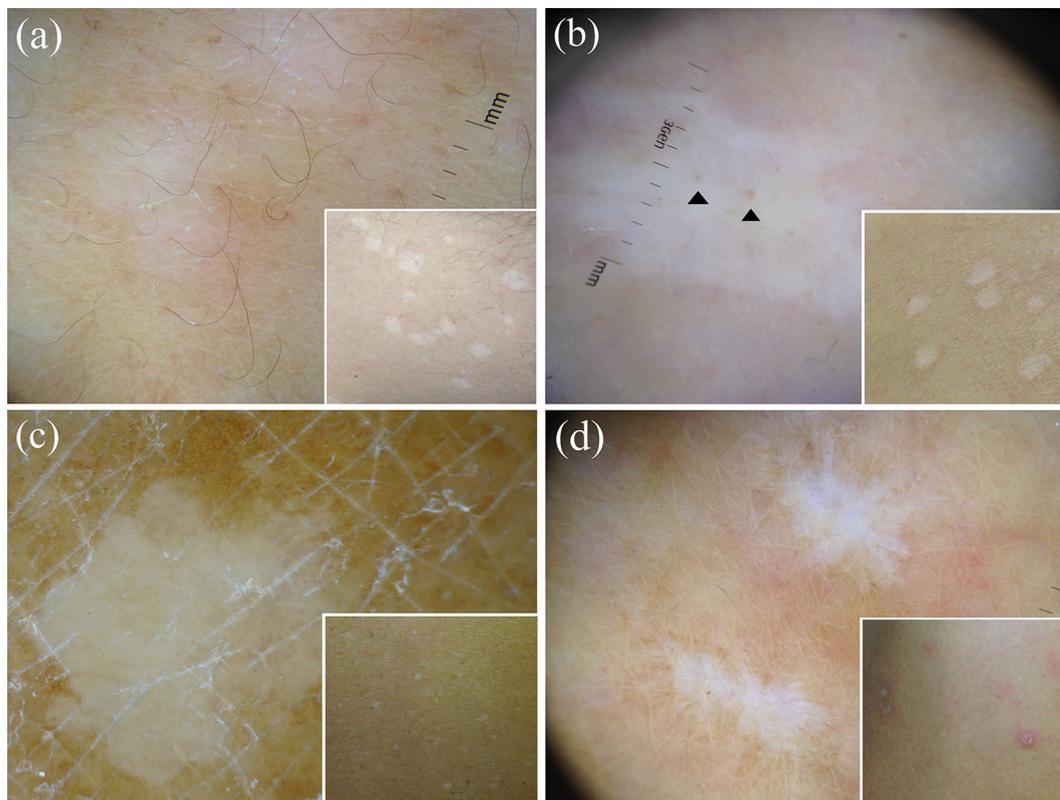


Fig. 7 Dermoscopy of achromic/hypochromic lesions of pityriasis versicolor usually shows a fairly demarcated white area with fine scales that are commonly localised in the skin furrows (a), while active lesions of guttate vitiligo typically display a well-demarcated, dense/glowing, often associated with perifollicular hyperpigmentation (black arrowheads) (b). Dermoscopic examination of idiopathic guttate hypomelanosis may show multiple small areas

coalescing into irregular/polycyclic macules, with several white shades and both well- and ill-defined edges, surrounded by patchy hyperpigmented network (“cloudy sky-like” pattern) (c), whilst postinflammatory hypopigmentation often presents with some dermoscopic findings typical of the original lesions (in this case, the star-like arrangement typical of prurigo nodularis) (d)

HYPERPIGMENTED MACULOPAPULAR DISEASES

Pityriasis Versicolor (Level of Evidence: V—CR, PO)

Dermoscopy of hyperpigmented lesions of pityriasis versicolor shows fine whitish scaling (often localised in the skin furrows) associated with a pigmented network composed of brown stripes [107] or a diffuse, more or less

homogeneous, brownish pigmentation (Fig. 8a) (personal observations).

Lichen Planus Pigmentosus (Level of Evidence: V—CSS)

The main dermoscopic patterns of lichen planus pigmentosus are represented by a diffuse, structureless, brownish pigmentation and/or fine/coarse, grey-blue/brown dots/globules (Fig. 8b); perifollicular/annular

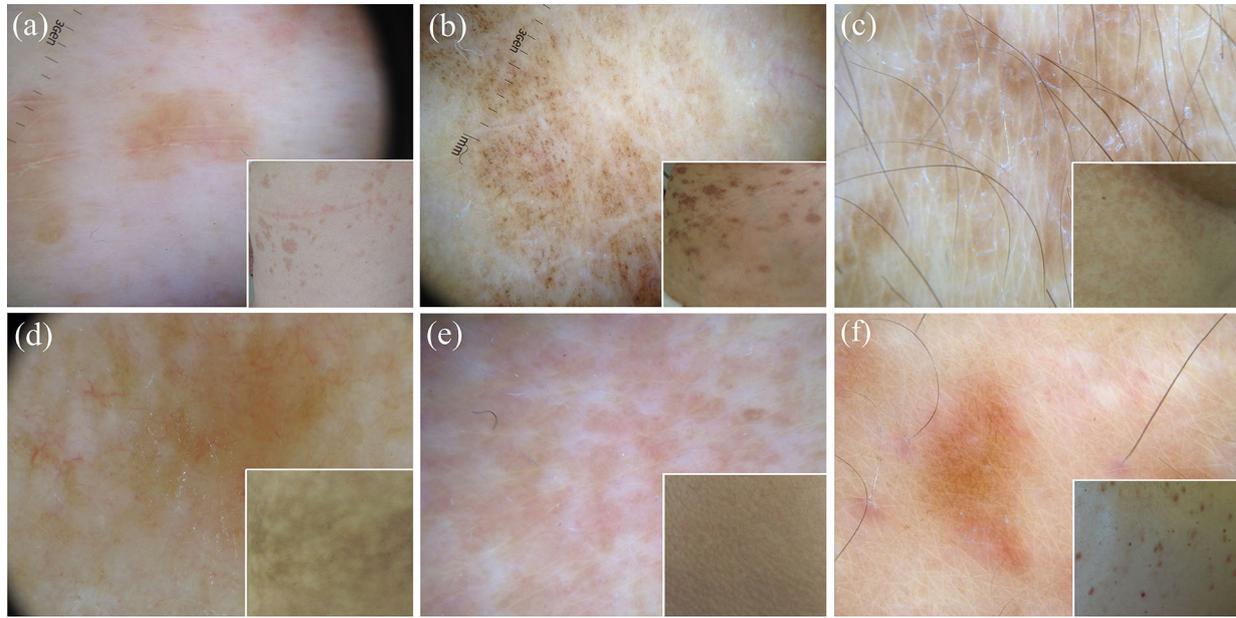


Fig. 8 Dermoscopy of hyperpigmented lesions of pityriasis versicolor often shows fine whitish scaling localised in the skin furrows associated with a diffuse brownish pigmentation (a). The most common dermoscopic finding of lichen planus pigmentosus is represented by fine/coarse, grey-blue/brown dots over a brownish background (b), while confluent and reticulated papillomatosis (Gougerot–Carteaud syndrome) displays fine whitish scaling and brownish, homogeneous, more or less defined, polygonal,

flat globules separated by whitish/pale striae creating a cobblestone pattern (c). Dermoscopic examination of pigmented lesions of erythema ab igne may reveal diffuse brownish pigmentation with telangiectatic vessels/fine whitish scaling, while friction melanosis and urticaria pigmentosa typically display brownish structureless areas arranged in a reticular fashion (e) and a homogeneous light-brown blot with a pigment network (f), respectively

pigmentation and white dots are other less common findings [38, 39, 108, 109].

Confluent and Reticulated Papillomatosis (Gougerot–Carteaud Syndrome; Level of Evidence: V—CSS, CR)

Confluent and reticulated papillomatosis typically displays fine whitish scaling associated with brownish, homogeneous, more or less defined, polygonal, flat globules separated by whitish/pale striae creating a cobblestone appearance [110] (Fig. 8c) or brownish areas presenting a “sulci and gyri” pattern [111].

Dowling–Degos Disease (Level of Evidence: V—CR)

The dermoscopic aspect of Dowling–Degos disease consists of a brown star-like area/irregular brownish projections with a hypopigmented centre over a brownish/reddish-brown background [112–114].

Erythema Ab Igne (Hyperpigmented Stage; Level of Evidence: V—PO)

The pigmentary stage of erythema ab igne is typically characterised by diffuse brownish pigmentation with or without telangiectatic vessels/whitish scaling (Fig. 8d) [110].

Primary Cutaneous Amyloidosis (Macular Amyloidosis and Lichen Amyloidosis; Level of Evidence: V—CSS)

The most common dermoscopic finding of both macular amyloidosis and lichen amyloidosis is a central hub (which is either white or brown in the former and white in the latter) surrounded by various configurations of brownish pigmentation, including fine radiating streaks, dots, leaf-like projections and bulbous projections [115]. Additionally, in lichen amyloidosis the central hub may be replaced by a scar-like area (which may be the only feature in larger and thicker lesions) and a rim of white collarette (resembling a volcanic crater) may sometimes be appreciated [115].

Friction Melanosis (Level of Evidence: V—CR)

The dermoscopic examination of friction melanosis typically reveals brownish structureless areas arranged in a reticular fashion (Fig. 8e) [115].

Terra Firma-Forme Dermatitis (Level of Evidence: V—CSS)

Dermoscopy of terra firma-forme dermatitis classically shows large polygonal plate-like brown scales arranged in a mosaic pattern [116].

Maculopapular Cutaneous Mastocytosis (Urticaria Pigmentosa, UP, and Telangiectasia Macularis Eruptiva Perstans, TMEP; Level of Evidence: V—CSS, CR)

The most common dermoscopic features of UP consist of a homogeneous light-brown blot and/or pigment network (Fig. 8f), while

TMEP is mainly characterised by reticular vessels on an erythematous/brownish base (“reticular vascular” pattern), sometimes associated with a brownish network [117–121]. However, dermoscopy cannot guarantee a reliable distinction of such conditions as, albeit uncommonly, UP may display the reticular vascular pattern as well [117]. Other less frequent vascular findings visible in both UP and TMEP include sparse dotted vessels and thin and tortuous linear vessels [117–121].

ITCHY PAPULONODULAR DERMATOSES

Hypertrophic Lichen Planus (Level of Evidence: V—CR)

Dermoscopic examination of hypertrophic lichen planus lesions displays a characteristic pattern consisting of a rippled surface with comedo-like structures filled with yellow keratinous plugs and/or round corneal structures (“corn pearls”) (Fig. 9a) [14, 15, 35–37, 108, 122]; less common features include Wickham striae, unspecific vascular findings (red globules, linear and dotted vessels), chalk-white structureless areas, scaling and central hyperpigmentation (Fig. 9a) [14, 15, 35–37, 108, 122].

Prurigo Nodularis (Level of Evidence: V—CSS)

The dermoscopic hallmark of prurigo nodularis (both hyperkeratotic and excoriated lesions) is represented by the presence of the so-called “white starburst pattern”, consisting of radially arranged whitish lines or peripheral whitish halo with some centrifugal coarse projections on a brownish and/or reddish background,

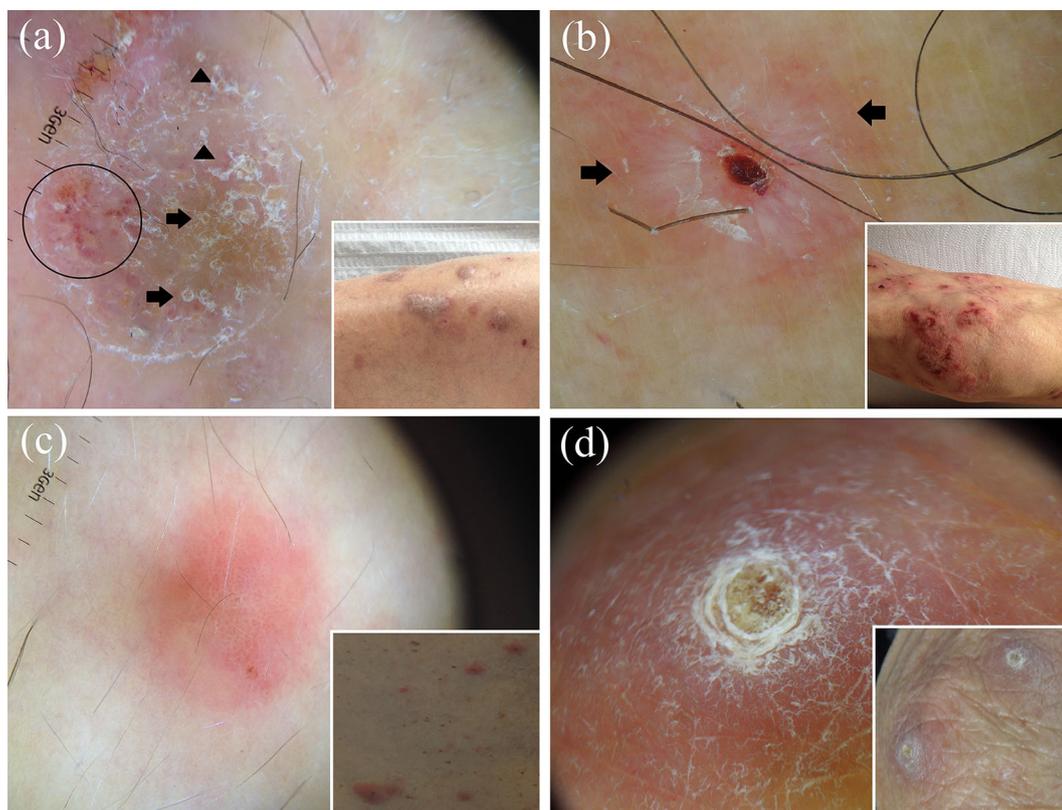


Fig. 9 Dermoscopy of hypertrophic lichen planus shows a peculiar pattern characterised by a rippled surface with comedo-like structures filled with yellow keratinous plugs (black arrows) and/or round corneal structures (“corn pearls”) (black arrowheads); some irregular dotted vessels (black circle), scaling and central hyperpigmentation are also present in this picture (a). Dermoscopy of a prurigo nodularis lesion displays the typical “white starburst pattern”, with radially arranged whitish lines (black arrows) on a brownish and/or reddish background; central erosion and scales are also present in this case (b). Although

dermoscopy of nodular scabies may often show the presence of mites (“hang glider sign”) and/or burrows (“jet with condensation trails”), it is not uncommon that the only detectable findings are nonspecific vascular features (mainly dotted vessels) (c). Dermoscopic examination of a case of reactive perforating collagenosis reveals the typical “three concentric areas” pattern, with a central round brownish-greenish/yellowish-brown structureless area, surrounded by a white keratotic collarette and an erythematous halo (d)

which may surround brown-reddish/brown-yellowish crust(s), erosion(s) and/or hyperkeratosis/scales (Fig. 9b) [106].

Nodular Scabies (Level of Evidence: V—CSS)

The distinctive dermoscopic sign of nodular lesions of scabies is the presence of mites (“hang

glider sign”) and/or burrows (“jet with condensation trails”) [123]. According to a recent study on ten patients with nodular scabies, the latter dermoscopic finding would be constantly present in such a type of scabies [123], but in our experience it may be missing (especially in extragenital sites) and unspecific vascular features (mainly dotted vessels) may be the only detectable findings (Fig. 9c) [1].

Acquired Perforating Dermatitis (Level of Evidence: V—CR)

The dermoscopic pattern of acquired perforating dermatosis is characterised by the presence of three concentric areas [1, 106, 124, 125], namely a central round brownish-greenish/yellowish-brown structureless area (I), surrounded by a white keratotic collarette (II) and an erythematous halo with or without dotted vessels (III) (“reactive perforating collagenosis” histological subtype) (Fig. 9d) [1, 106, 124] or bright white clods (I), centred in a structureless grey area (II), surrounded by reticular brown lines (III) (“perforating folliculitis” histological subtype) [125].

ERYTHRODERMAS

Erythrodermic Psoriasis (Level of Evidence: V—CR)

Dermoscopy of erythrodermic psoriasis reveals a monomorphous pattern with diffusely distributed whitish scales and regularly arranged dotted/glomerular vessels on a fairly homogeneous reddish background [29, 126].

Erythrodermic Atopic Dermatitis (Level of Evidence: V—CR)

As for other types of eczematous dermatitis, the most important dermoscopic features of erythrodermic atopic dermatitis consist of yellowish scales/serocrusts and patchily distributed dotted vessels on a pinkish background; unspecific sparse whitish scales may also be seen [29].

Erythrodermic Mycosis Fungoides (Level of Evidence: V—CR)

The most characteristic dermoscopic finding of erythrodermic mycosis fungoides is represented by the combination of linear vessels (some of them having a spermatozoon-like shape) and dotted vessels over a whitish-pinkish background; unspecific sparse whitish scales are also visible [29].

Erythrodermic Pityriasis Rubra Pilaris (Level of Evidence: V—CR)

Dermoscopy of erythrodermic pityriasis rubra pilaris typically displays peculiar orange blotches and islands of nonerythematous (spared) skin displaying reticular vessels; additional features include diffuse whitish scaling and scattered dotted vessels over a reddish background [29].

Erythrodermic Scabies (Level of Evidence: V—CR)

The main dermoscopic findings of erythrodermic scabies include whitish scales and thousands of characteristic dark-brown triangular structures located at the end of whitish structureless wavy lines (delta-wing jets with contrail) over a reddish background [127].

COMMON FORMS OF NONINFECTIOUS BALANITIS AND ERYTHROPLASIA OF QUEYRAT

Zoon’s Plasma Cell Balanitis (Level of Evidence: V—CSS)

The dermoscopic hallmark of Zoon’s plasma cell balanitis is the presence of focal/diffuse orange-yellowish structureless areas and/or fairly focussed curved vessels (including serpentine, convoluted and chalice-shaped);

other possible findings include linear irregular blurry vessels and dotted vessels [128].

Psoriatic Balanitis

From a dermoscopic point of view, psoriatic balanitis is characterised by the presence of regularly distributed dotted/glomerular vessels [23, 129].

Seborrheic Dermatitis and Non-Specific Balanitis (Level of Evidence: V—PO)

Seborrheic dermatitis and non-specific balanitis usually show only linear irregular unspecific blurry vessels [128].

Erythroplasia of Queyrat (Level of Evidence: V—CR)

Erythroplasia of Queyrat has been reported to show scattered glomerular vessels [130].

COMMON INFLAMMATORY CICATRICAL ALOPECIA

Discoid Lupus erythematosus (Level of Evidence: II)

The dermoscopic hallmarks of active discoid lupus erythematosus of the scalp are represented by follicular keratotic plugs (quite large yellowish/whitish dots) and thick arborising vessels

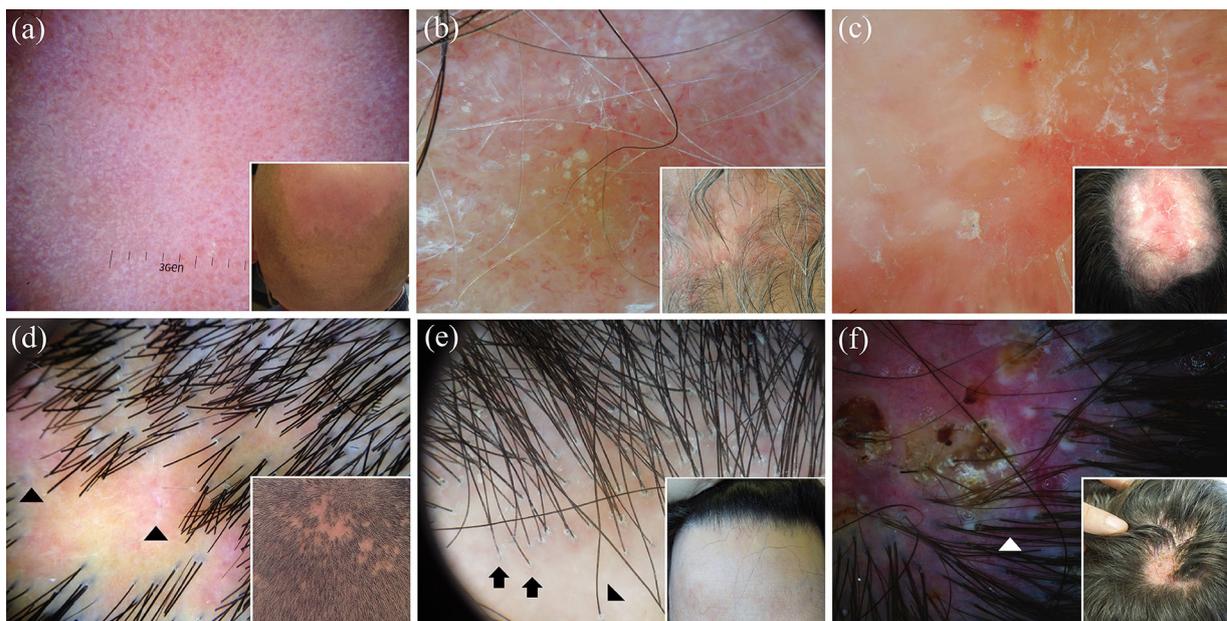


Fig. 10 Dermoscopy of discoid lupus erythematosus of the scalp varies according to the disease stage: active lesions may be mainly characterised by red dots (a) or follicular keratotic plugs (quite large yellowish/whitish dots) and thick arborising vessels (b), while long-lasting lesions commonly display loss of follicular openings, white areas and thin vessels (c). The main dermoscopic hallmarks of active lichen planopilaris are perifollicular scales; characteristic (but not pathognomonic) white dots (fibrotic white dots) (black arrowheads) and a reddish background are also present in less active areas in this case (d).

Dermoscopic examination of a case of frontal fibrosing alopecia reveals minor perifollicular scaling with an aflegmasic (ivory white to ivory beige) surrounding background; follicular openings with only one hair at the hair-bearing margin (black arrows) and lonely hair (black arrowhead) are also visible (e). Classic dermoscopic appearance of active folliculitis decalvans showing follicular pustules, yellow discharge, crusts and characteristic hair tufts that contain >10 hair shafts (white arrowhead); unspecific vessels and erythema are also evident in the picture (f)

(Fig. 10a, b) [131–137]; additional findings include fine interfollicular scaling, blue-grey dots, scattered brown discolouration and red dots (Fig. 10a) [131–137]. Thin arborising vessels emerging from the yellow dots (“red spider in a yellow dot”) are considered peculiar of late, pre-fibrotic lesions [133], while pink areas, loss of follicular openings, white areas and branching vessels are typical of long-lasting lesions (Fig. 10c) [131, 133–137].

Lichen Planopilaris (Level of Evidence: II)

The main dermoscopic features of active lichen planopilaris are perifollicular scales, which typically migrate along the hair shaft and form a tubular structure covering the proximal portion of the emerging hair shaft (“collar-like” or “tubular” perifollicular hyperkeratosis) (Fig. 10d) [132, 133, 136–141, 149, 150]; other possible dermoscopic findings of active lesions include violaceous or violet-brown inter- or perifollicular violaceous areas (Fig. 10d), perifollicular inflammation, elongated linear blood vessels in concentric arrangement and target “blue-grey dots” [132, 133, 136–141, 149, 150]. Inactive/late lesions may show characteristic (but not pathognomonic) irregular, large white dots (fibrotic white dots) (Fig. 10d) as well as less specific findings such as acquired pili torti, loss of follicular openings, white areas, honeycomb/scattered hyperpigmentation, milky red areas (strawberry ice cream colour) and small hair tufts of 5–9 hairs [132, 133, 136–141, 149, 150].

Frontal Fibrosing Alopecia (Level of Evidence: II)

The most common dermoscopic findings in frontal fibrosing alopecia include a lack of follicular openings and minor perifollicular

scaling [131, 132, 137, 140–144]; additionally, perifollicular erythema may be seen but the surrounding background is usually aflegmatic (ivory white to ivory beige) (Fig. 10e) [131, 132, 137, 140–144]. Interestingly, there is often a strong predominance of follicular openings with only one hair at the hair-bearing margin and lonely hair may be observed (Fig. 10e) [131, 132, 137, 140–144]. Fine arborising vessels and perifollicular brown or brown-violet areas may sometimes be visible [131, 132, 137, 140–144].

Folliculitis Decalvans (Level of Evidence: II)

The most characteristic dermoscopic feature of folliculitis decalvans is the presence of hair tufts that contain >10 hair shafts (Fig. 10f), which are often surrounded by a band of yellowish scales (yellowish tubular scaling) and by perifollicular epidermal hyperplasia (which may be arranged in a starburst pattern) at their base [132, 133, 137, 145–148]; other peculiar findings in active folliculitis decalvans include follicular pustules and yellow discharge and crusts (Fig. 10f) [132, 133, 137, 145–149]. A perifollicular concentration of blood vessels (elongated loops/coiled vessels) and a perifollicular erythema arranged in a starburst pattern may also be visible [132, 133, 137, 145–147, 149]. In long-lasting lesions, ivory-white and milky-red areas without follicular orifices predominate [145].

COMMON NONSCARRING ALOPECIAS

Alopecia Areata (Level of Evidence: II)

The most characteristic findings of active alopecia areata include black dots,

micro-exclamation mark hairs, broken hairs, tapered hairs, monilethrix-like hairs and trichorrhexis nodosa, while long-standing inactive disease is mainly characterised by yellow dots and vellus hairs (Fig. 11a) [131, 139, 151–158]. The main signs of regrowing consist of upright and regularly coiled (circle and/or pigtail) hairs [131, 139, 151–158]. Less specific/less common features of active stages include tulip hairs and zigzag hairs [151, 152].

Trichotillomania (Level of Evidence: II)

Dermoscopy of trichotillomania often reveals a chaotic pattern of diverse findings related to hair fracturing [151, 159]. The most peculiar features include hairs broken at different lengths, short hairs with trichoptilosis (“split ends”), irregular coiled hairs, amorphous hair residues, black dots, flame-like hairs, tulip-like hairs (short hairs with darker, tulip-shaped ends) and V-sign (two or more hairs emerging from one follicular unit that are broken at the same level black arrowhead)

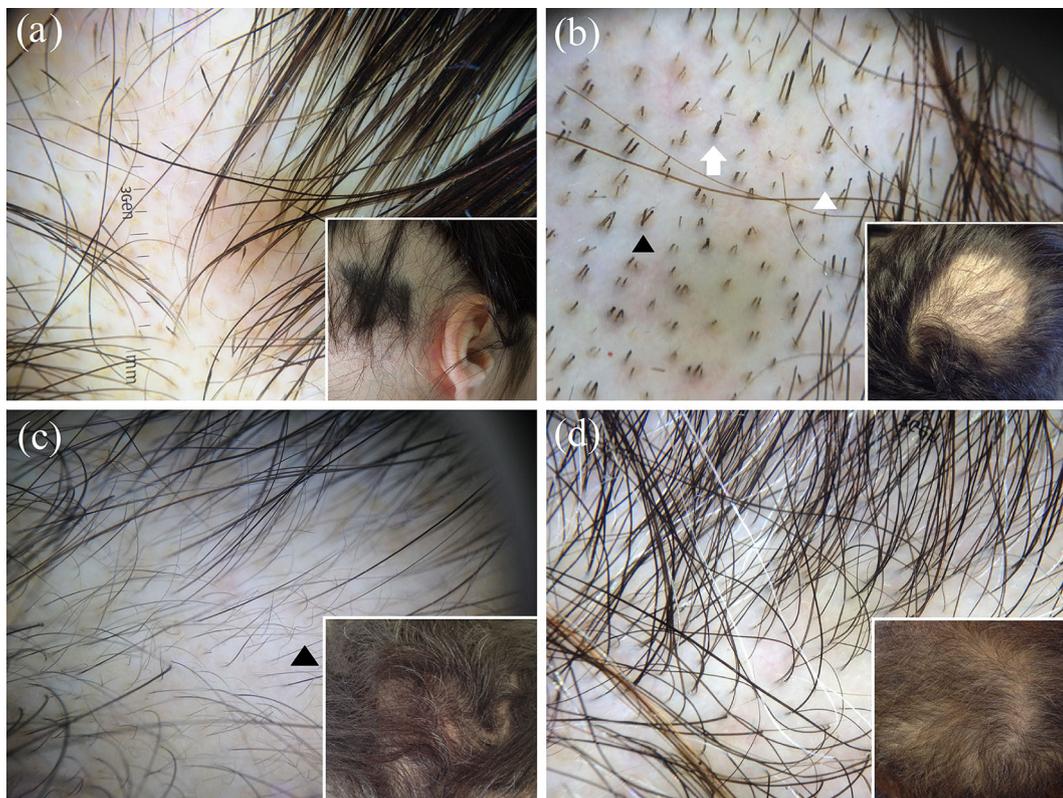


Fig. 11 Dermoscopic examination of a case of active alopecia areata shows black dots and micro-exclamation mark hairs; regular yellow dots are also evident (a), while dermoscopy of trichotillomania reveals a chaotic pattern of diverse findings related to hair fracturing, including (in this case) hairs broken at different lengths, black dots, flame-like hairs (white arrow), tulip-like hairs (short hairs with darker, tulip-shaped ends white arrowhead) and V-sign (two or more hairs emerging from one follicular unit that are broken at the same level black arrowhead)

(b). Dermoscopy of androgenetic alopecia typically shows hair shaft thickness heterogeneity, a large number of follicular units with only one emerging hair shaft, and an increased proportion of thin and vellus hairs (>10% of the hairs); wavy hairs are also visible (black arrowhead) (c). The most indicative dermoscopic clue of telogen effluvium is the lack of features typical of other diseases; empty hair follicles and follicular units with only one hair are also evident in this case of chronic telogen effluvium (d)

from one follicular unit that are broken at the same level) (Fig. 11b) [131, 139, 151, 156, 159–163]. Less common/less specific findings are tapered hairs, follicular microhemorrhages, micro-exclamation mark hairs and upright regrowing hairs [151, 159–163].

Androgenetic Alopecia (Level of Evidence: IV)

The main dermoscopic features of androgenetic alopecia include hair shaft thickness heterogeneity, yellow dots (irregularly distributed and with a remarkable variability in size and shape), perifollicular discolouration (the peripilar sign), an increased proportion of thin and vellus hairs (>10 % of the hairs) and a large number of follicular units with only one emerging hair shaft (Fig. 11c) [131, 132, 139, 164–168]. Thin wavy hair and honeycomb hyperpigmentation often coexist as additional, nonspecific features (Fig. 11c) [131, 132, 139, 164–168].

Telogen Effluvium (Level of Evidence: IV)

The most indicative dermoscopic clue of telogen effluvium is the lack of features typical of other diseases (Fig. 11d) [131, 139, 169]; common, but nonspecific, findings include the presence of empty hair follicles, a predominance of follicular units with only one hair, perifollicular discolouration (the peripilar sign), upright regrowing hairs (mainly acute forms) and progressive uniform hair thinning (chronic forms) (Fig. 11d) [131, 139, 169]. There is no significant difference between the findings in the frontal area and those in the occipital area, which differentiates telogen effluvium from androgenetic alopecia; however, it is important to underline that both disorders may coexist [131, 139, 169].

COMMON SCALING DISORDERS OF THE SCALP

Tinea Capitis (Level of Evidence: II)

The main dermoscopic features of tinea capitis are represented by “comma” hair (c-shaped hair shaft with a sharp, slanting end and homogeneous thickness), “corkscrew” hair (twisted or coiled, short, broken hair fragments), “zigzag” hair (hair shaft bent at multiple points) and “Morse code” hair [presence of multiple transverse bands (gaps) throughout the hair shaft] (Fig. 12a) [151, 170–187]. Other nonspecific trichoscopic findings in TC include broken and dystrophic hairs, i-hair, black dots, yellowish dots, erythema, scaling, pustules, elongated blood vessels, tufted hair and large yellowish wax-coloured perifollicular areas (favus) [151, 170–187].

Scalp Psoriasis (Level of Evidence: III)

The most indicative dermoscopic features of psoriasis of the scalp are represented by red dots and red globules as well as (with a lower specificity) signet ring vessels, red loops, white scales, punctate haemorrhages and hidden hairs (Fig. 12b) [138, 188–190]. Additional (but unspecific) findings include other vascular structures, pigmentations (perifollicular pigmentation, honeycomb pigment pattern and brown dots) and white/yellow dots [138, 188–190].

Seborrheic Dermatitis (Level of Evidence: III)

The most characteristic dermoscopic findings of seborrheic dermatitis of the scalp consist of arborising vessels [138, 188–190]; additional

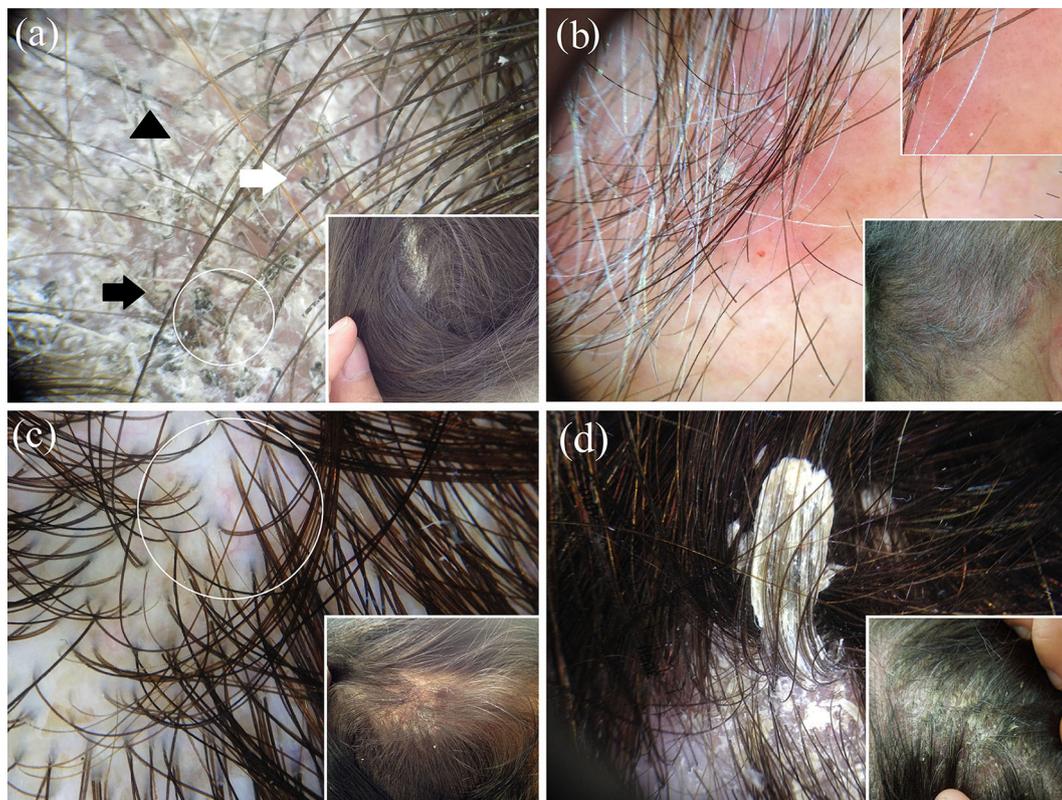


Fig. 12 Dermoscopic examination of a case of tinea capitis displays scaling and the peculiar “comma” hair (white arrow), “corkscrew” hair (white circle), “zigzag” hair (black arrow) and “Morse code” hair (black arrowhead) (a). Dermoscopy of scalp psoriasis reveals the typical dotted vessels (magnified in the upper-right box) and white scales; a haemorrhagic spot is also evident (b). Differently from

psoriasis, scalp seborrhoeic dermatitis shows yellowish scales and the characteristic arborising vessels (white circle) (c). Dermoscopic examination of pityriasis amiantacea displays diffuse white scaling and the characteristic compact white keratotic material adhering to a tuft of hair (asbestos-like scale) (d)

indicative features are yellowish scaling, featureless areas (structureless red areas), honeycomb pigment and comma vessels (Fig. 12c) [138, 188–190]. Less specific finding include other vascular structures, pigmentations (perifollicular pigmentation, honeycomb pigment pattern and brown dots) and white/yellow dots [138, 188–190].

Pityriasis Amiantacea (Level of Evidence: V—CR)

Dermoscopy of pityriasis amiantacea typically displays diffuse white scaling and the

characteristic compact white keratotic material adhering to a tuft of hair (asbestos-like scale) (Fig. 12d) [191].

CONCLUSIONS

Dermoscopy may be a helpful auxiliary tool in assisting the the noninvasive recognition/differential diagnosis of several “general” dermatoses by magnifying both surface structures and subsurface features that are invisible to the unaided eye and reflect the different histopathological background of each condition. Importantly, this article

should be read with a critical eye as it presents three limitations: (1) the comparative analysis of several dermatoses is not the result of direct comparative studies but has been made merely considering the dermoscopic appearance of each condition; (2) the dermoscopic description of some considered diseases is based on limited observations; (3) the level of evidence assigned to each dermatosis is based on the study/studies showing the best evidence available, so some of the reported dermoscopic findings might come from works with a lower level of evidence. Of note, in this analysis, we also considered studies lacking strong evidence as there is a growing recognition that observational studies (even case series, case reports and anecdotes) may provide worthy information, especially if they are properly supported by mechanism-based reasoning (e.g. dermoscopic-pathological correlations) [192–194]. Anyway, further high-quality, prospective, blinded, controlled investigations are needed to better characterise the use of dermoscopy in general dermatology.

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Compliance with Ethics Guidelines. The article is based on previously conducted studies and does not contain any new studies with human or animal subjects performed by any of the authors.

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