

Diagnostic Dermoscopy

The Illustrated Guide

SECOND EDITION

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Dermoscopy has been fully embraced by dermatologists and all those involved in skin cancer diagnosis as the gold standard tool used for clinical examination and diagnosis. It is simple to utilise, quick to apply and requires very little additional resource apart from the dermoscopy device/dermoscope itself.

However, without understanding the utility of dermoscopy, in wider clinical practice, the full diagnostic potential for the clinician may not be reached.

Format and imaging

This book is specifically a textbook with an emphasis on diagnosis, and diagnosis alone. In this way we are able to provide a comprehensive guide to the common presentations of skin lesions seen in clinics in addition to some of the more uncommon. From this starting point of diagnosis the rest of medical management flows. With greater confidence in diagnosis, a reduction in unnecessary biopsies can be achieved which frees resources to meet the increasing demand from rising skin cancer rates. Additionally, finding skin cancers at an earlier point in their evolution consumes less resources in surgical and medical management, and reduces patient morbidity and mortality.

For each topic covered, the clinical images are aimed to be standardised for illumination and orientation to aid recognition whilst illustrating the main clinical features. The adjoining dermoscopy image focuses upon key diagnostic features, which in combination with the clinical information should be all that is required for a specific diagnosis or at least a narrow differential diagnosis to be made.

Whenever possible, images of conditions have been taken across skin tones and with different dermoscope devices in different imaging modes to illustrate the broad variety of presentations to the clinician.

Therefore, we anticipate that this book becomes a user-friendly guide, to be used in clinic by not only clinicians and nurses but also by any allied paramedical staff involved in skin lesion diagnosis.

Teledermoscopy

This format also lends itself to the growing field of teledermoscopy.

With teledermoscopy becoming an integral part of clinical practice it is helpful to have a collection of illustrated cases for reference. Therefore, throughout this book, for each topic covered, a minimal dataset, is included. This dataset includes a brief clinical description of the lesion, anatomical site and age and sex of the patient, a clear clinical image and a corresponding dermoscopic image highlighting a diagnostic feature. This textbook therefore becomes a useful reference manual, of over 500 cases, for anyone involved in teledermoscopy consultations.

Dermoscopy devices

Over the last 10 years, the greatest change in dermoscopes has been the standardisation and incorporation of both polarising and non-polarising imaging modes into the majority of dermoscopes. This leads to an increase in dermoscopic diagnostic information available for interpretation, with a simple toggle/push of a button to change between the two imaging modes. By switching between imaging modes, a composite 'occipital cortex' image can be created for interpretation and diagnosis.

There are multiple devices available for the clinician to choose. This book does not aim to advise on which device is best suited for the clinician. All we would advise is that the device sought is of a quality that allows the user to see a clear, bright, image for interpretation. The device must be robust enough for regular daily use and ergonomically designed so that it feels good in the clinician's hand. High-quality optics will ensure a crisp focused image for interpretation or image capture with a camera. The field of view needs to be of a size to provide a clear image but not too large to compromise optics or utility.

With all devices the ability to keep the dermoscope fully charged during clinical use is also an important consideration.

Therefore, for the variables mentioned above it would not be unusual for the dermoscopy enthusiast to have more than one dermoscope in regular clinical use.

Which dermoscope is best suited to your own practice is a personal choice for the clinician. Most importantly, the clinician should find a dermoscope that you want to pick up and use, feels good in your hand and fits in with your scope of clinical practice.

Clinical and histopathological correlation

We would like to emphasise that clinical diagnosis is a complex process and is based upon the summation of all relevant clinical information from the clinical history, clinical examination and dermoscopic examination.

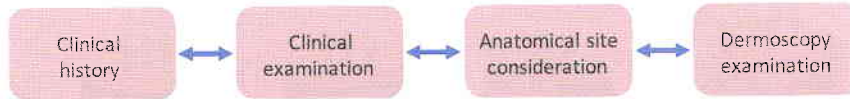
Additionally, the importance of close clinico-pathological correlation cannot be underestimated. As dermoscopy provides a horizontal aerial view of skin microstructures, these dermoscopic findings should always be provided (in addition to the detailed clinical history and findings from clinical examination) in all samples sent for histopathology. Simple refinements such as marking the specimen for orientation, adding a map of the area of pathological interest, can help diagnosis and improve the quality of the report.

If clinical concern remains despite histopathology reporting, we would advise seeking engagement with your histopathology colleagues, for a case review, to ensure that the correct diagnosis is reached ultimately to the benefit of the patient.

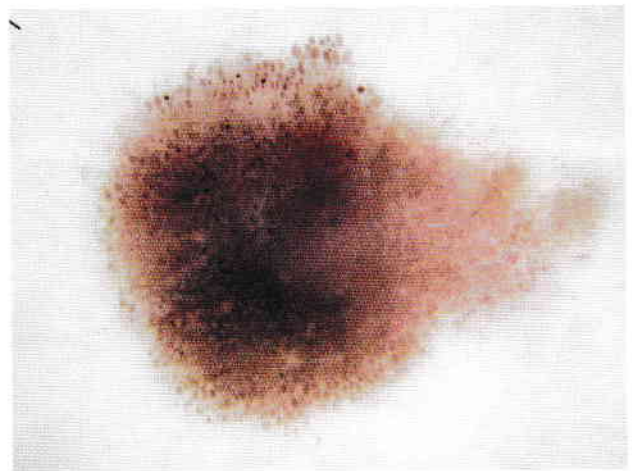
As clinicians, we are accountable for our decision making, which should be based on the best possible evidence. Hopefully this book will help in that decision-making process.

The diagnosis is in the detail.

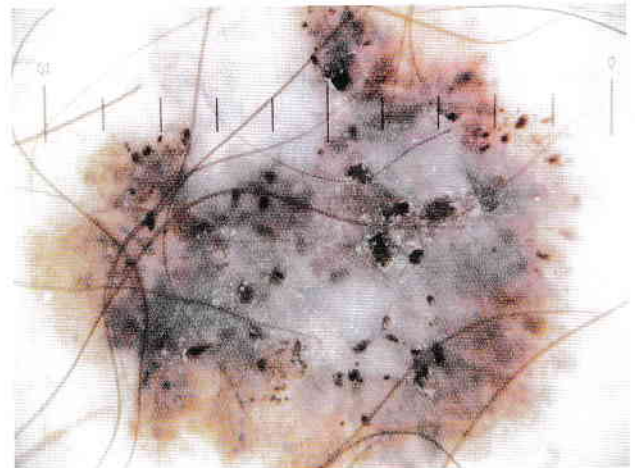
Dermoscopy and diagnosis



A clinical diagnosis is based upon the summation of components available for interpretation. It is not a linear progressive thread but a dynamic multiwoven fabric. Information from each progressive stage, clinical history, examination, site specifics and dermoscopy should be relayed back to the previous stages to guide analysis and refine the diagnostic process. In this way, features that were initially only thought visible on dermoscopy may also now be seen on clinical examination.

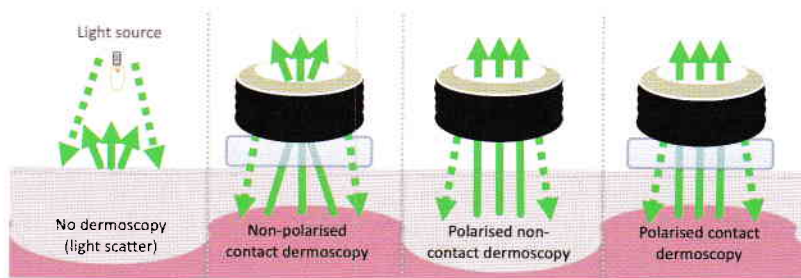


A pigmented macule on the arm of a 40-year-old woman confirmed as a 0.3 mm thick superficial spreading melanoma (SSM): dermoscopy shows eccentric irregular globules that can now also be seen on review of the clinical image.



A variably pigmented macule on the arm of a 60-year-old woman confirmed as a 0.8 mm thick SSM: dermoscopy shows eccentric regression and atypical pigmented globules that can now also be seen on review of the clinical image.

Aim to constantly improve and refine clinical examination by re-assessing clinically for morphological structures once identified on dermoscopy.



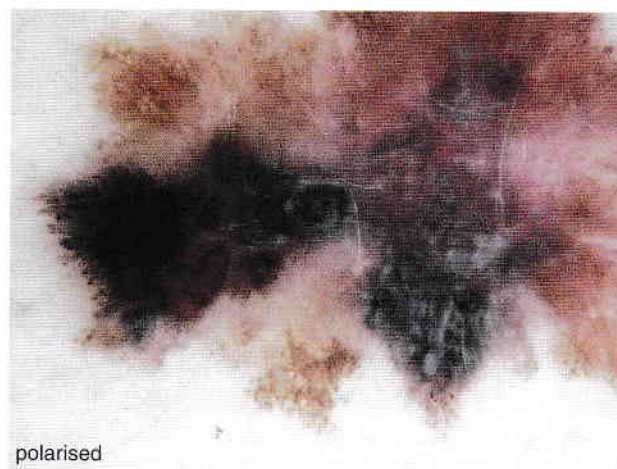
Skin is not smooth, but a layer of overlapping skin scales which scatter light when illuminated compromising visualisation of structures within the skin. This light scatter can be overcome through application of a surface interface medium, such as alcohol gel, or by using polarised light. Dermoscopes, with an internal light source and $\times 10$ magnification, have become the standard diagnostic device for skin lesion examination. By combining contact polarised and non-polarised dermoscopy, the greatest diagnostic detail can be seen.



The details seen in this 0.8 mm thick SSM are more clearly seen on clinical examination following elimination of light scatter by application of alcohol gel.



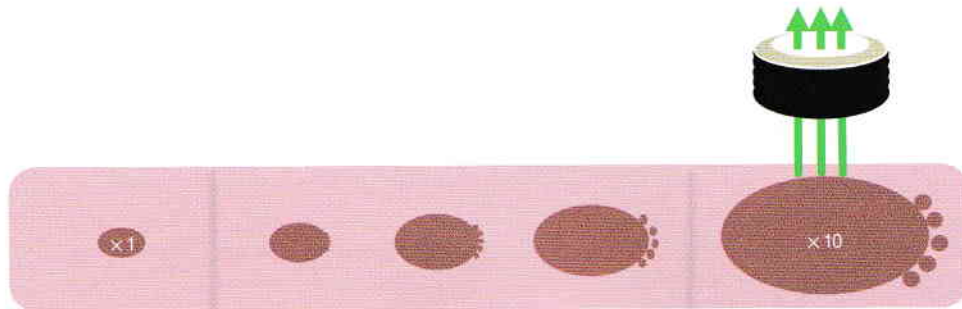
non-polarised



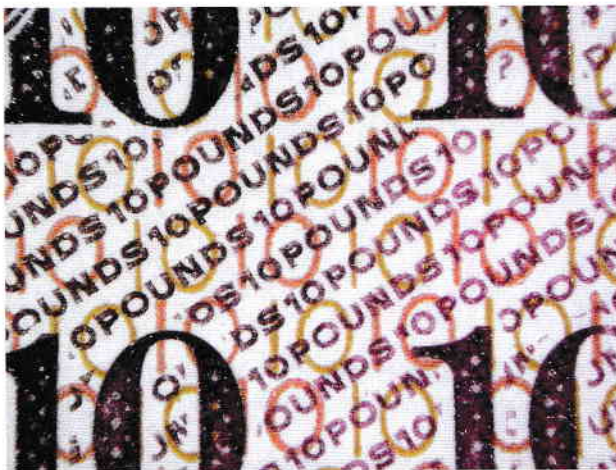
polarised

Combining dermoscopic features from both non-polarised and polarised imaging modes provides the maximum information for diagnosis in this 0.8 mm thick SSM.

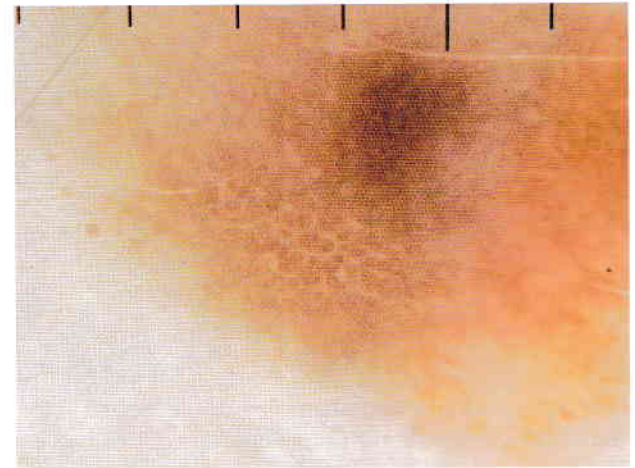
Alcohol gel applied to the skin lesion prior to clinical and dermoscopic examination will aid diagnosis by reducing light scatter.



Magnification devices have been used in clinical practice for centuries. With increasing magnification, microstructures in the skin, which are invisible to the naked eye, suddenly become visible. These subtle features may be the only feature to provide early diagnosis of melanoma and hence as many lesions as possible should be examined with dermoscopy rather than naked eye preselection of a select few. Dermoscopy devices range in magnification although $\times 10$ has become the standard.



International bank notes showing the microprint that is only visible on dermoscopy, illustrating the limitations of diagnostic detail seen on naked eye examination alone.

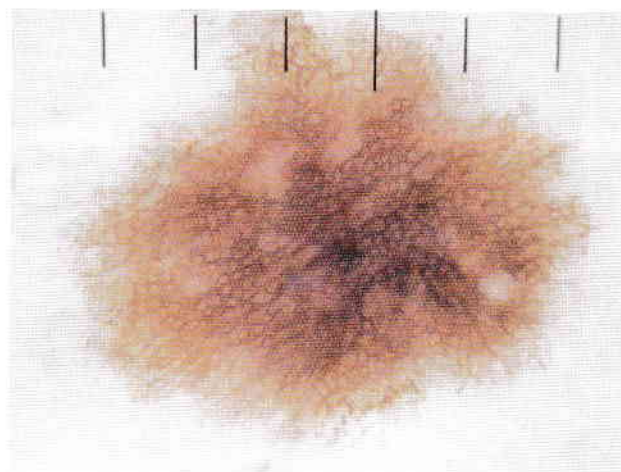
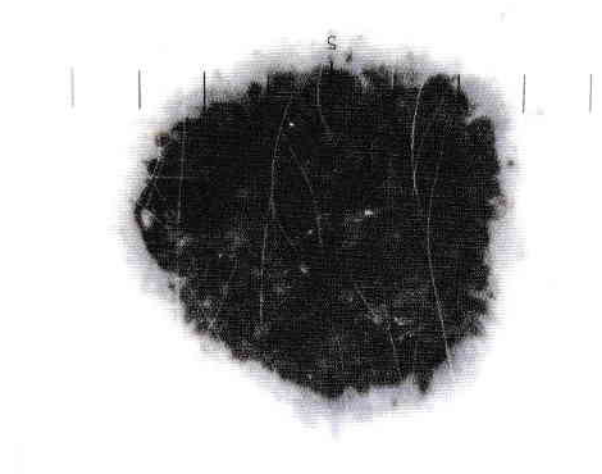


A melanocytic lesion on the knee of a 25-year-old woman: dermoscopy shows eccentric pigment globules and a focus of negative network in this case of melanoma in situ, which are only evident on dermoscopy.

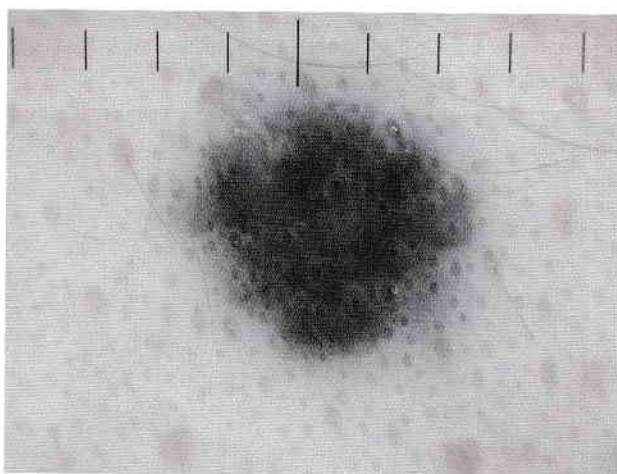
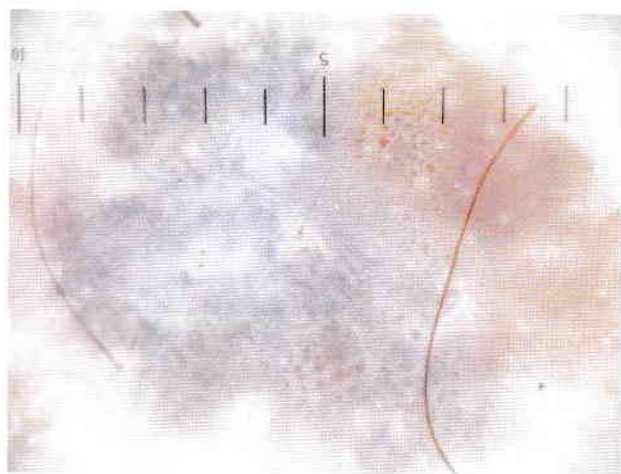
Dinnes, J. et al. Dermoscopy, with and without visual inspection, for diagnosing melanoma in adults. *Cochrane Database Syst Rev.* 2018;12(12):CD011902.



Melanin is the dominant pigment chromophore in the skin and exists in two forms, eumelanin (brown and black) and pheomelanin (red and yellow). The colours within melanocytic skin lesions depend not only upon the ratio of eumelanin to pheomelanin but also the pigment depth in the skin. The colour black is seen when eumelanin is present in the upper epidermis, browns in the epidermis, grey in the papillary dermis and slate blue in the deeper dermis.



Black is a feature of eumelanin located high in the epidermis and can be seen in ink spot lentigines, Spitz naevi and melanoma; brown is the most commonly observed colour of melanocytic lesions and is due to melanin in the epidermis.

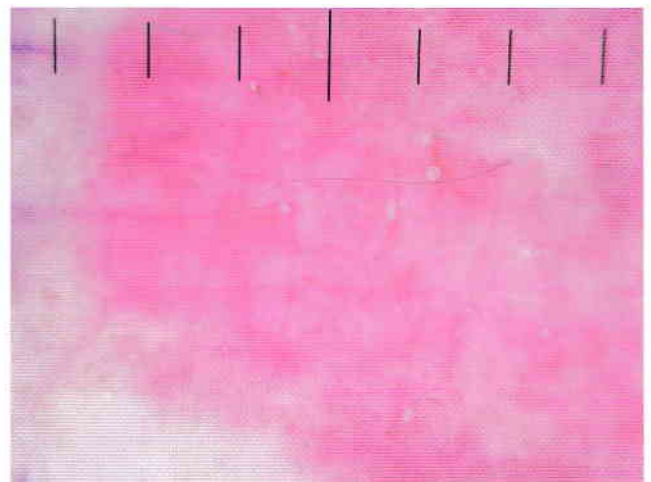
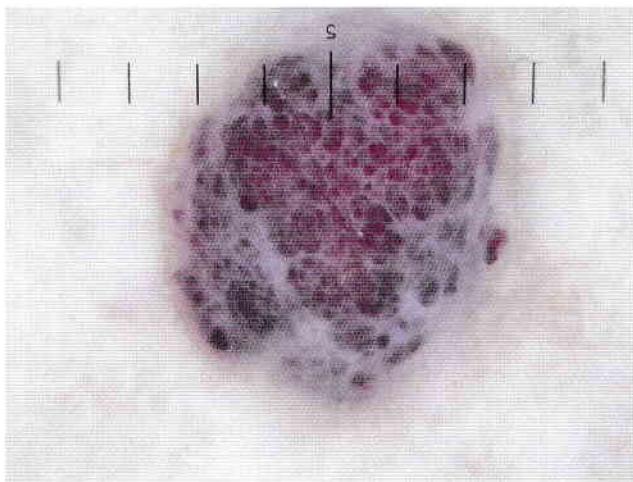


Grey pigmentation is seen when eumelanin is located in the papillary dermis (e.g. regression); slate blue is seen when eumelanin is located in the deeper dermis (e.g. blue naevi).

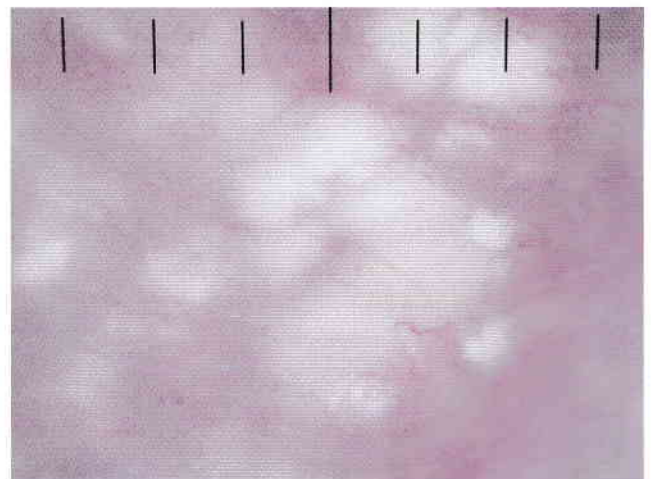
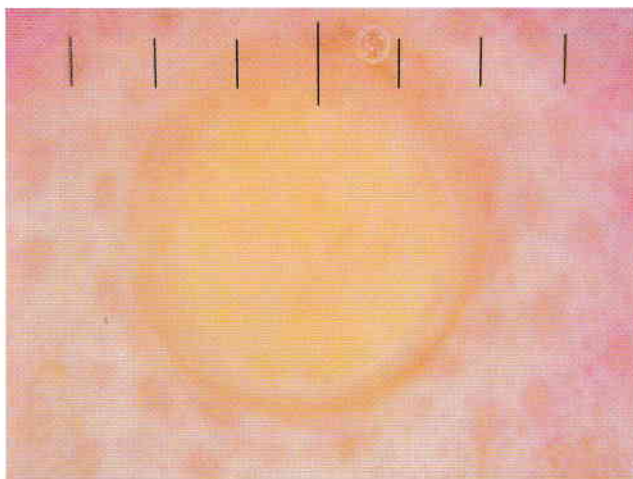
Note: Melanin pigmentation can be a dominant feature of non-melanocytic tumours, where tumour aggregates accumulate melanin from neighbouring melanocytes, such as seborrhoeic keratoses and pigmented basal cell carcinomas (BCC).



Non-eumelanin chromophores in the skin include phaeomelanin (red and yellow), haemoglobin (red and purple), keratin (white and yellow), lipids (yellow) and collagen (white). Lesions with these chromophores may show a range of colours from red, pink, orange, yellow, cream and white. If these colours predominate in the skin lesion the differential diagnosis should be extended to include not only melanocytic but non-melanocytic, inflammatory and infective skin lesions.



Purple and red colours are a typical feature of vascular lesions; pink colour is very non-specific and can be seen in melanocytic, non-melanocytic, infective or inflammatory lesions.

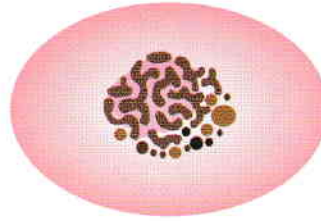


Orange is a colour that is commonly seen in melanocytic (phaeomelanin), lymphatic, granulomatous and xanthogranulomatous conditions; creamy yellow colour is seen in keratinising lesions, xanthomas, gouty tophi and sebaceous lesions.

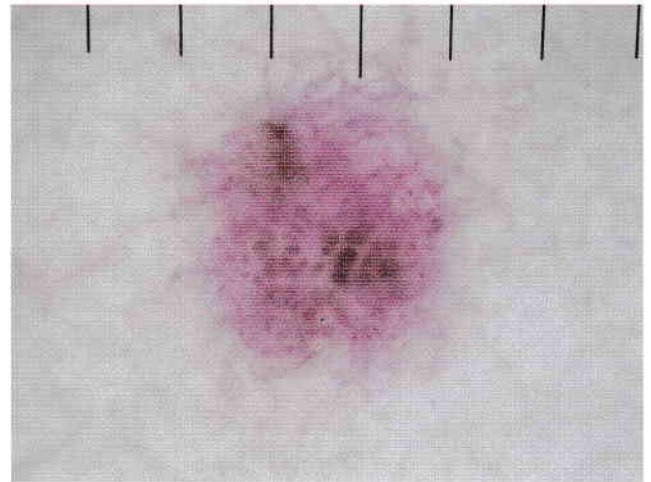
Beware of the solitary pink lesion. Pink skin lesions can be melanocytic, non-melanocytic, infective or inflammatory. Diagnosis should be based upon clinical history and examination, dermoscopy and, where indicated, histopathology.

3.1 Melanoma – clinical variants

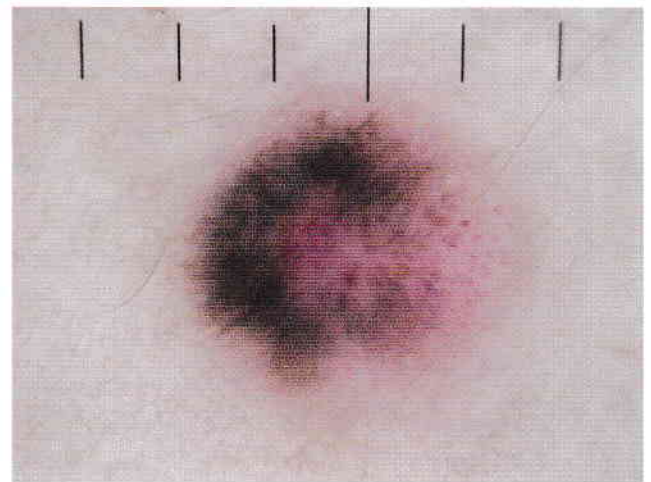
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As melanomas evolve they develop more dermoscopic features. These same dermoscopic features may be seen in small diameter melanocytic lesions suggesting a diagnosis of melanoma. This principle also helps to identify melanomas on sequential dermoscopic imaging.



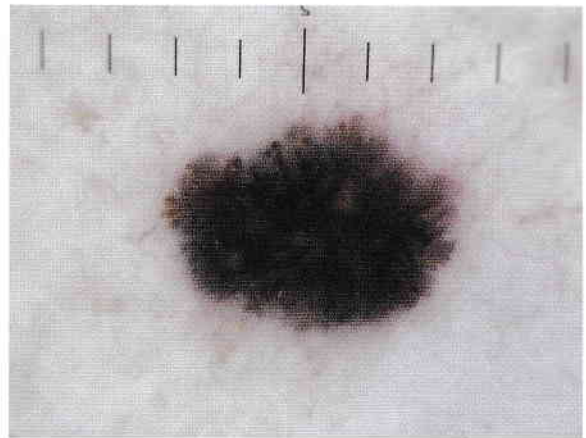
A 3 mm pink macule on the shoulder of a 19-year-old woman: dermoscopy shows irregular brown globules and dotted vessels in this 0.3 mm thick superficial spreading melanoma (SSM).



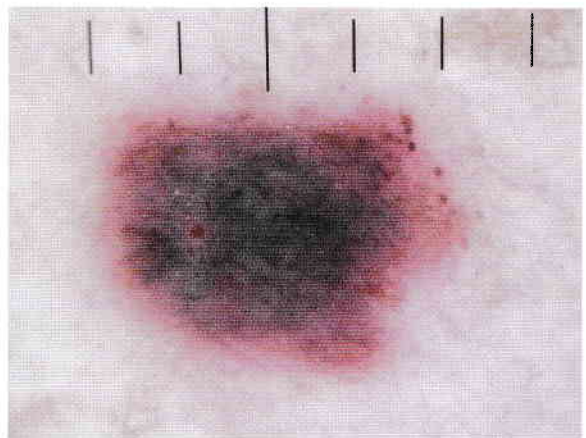
A 3 mm hyperpigmented macule on the back of a 30-year-old man: dermoscopy shows a disordered lesion with irregular brown globules, polymorphous vessels and peripheral streaks in this 0.6 mm thick SSM.

Seidenari, S. et al. Dermoscopy of small melanomas: just miniaturized dermoscopy? *Br J Dermatol.* 2014;171(5):1006–1013.

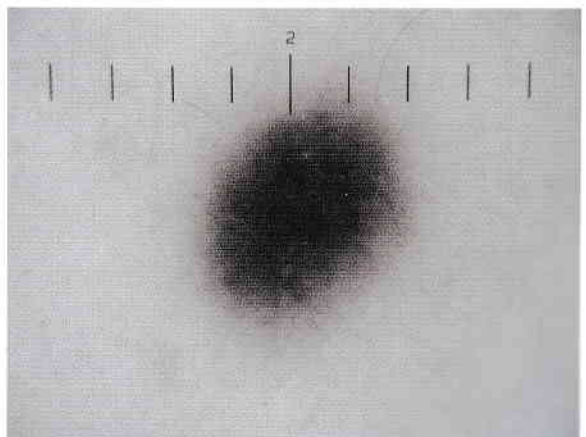
Small diameter cases



A 4 mm pigmented macule on the shoulder: dermoscopy shows irregular globules, peripheral streaks and a blue-whitish veil in this 0.3 mm thick SSM.



A 4 mm pigmented macule on the lower leg: dermoscopy shows eccentric irregular brown globules, dotted vessels and a blue-whitish veil in this 0.6 mm thick SSM.



A 4 mm blue-brown macule on the back of a 20-year-old man: dermoscopy shows multiple colours including central ill-defined blue-whitish veil, shiny white streaks and diffuse dotted and linear vessels in this 0.4 mm thick SSM.

Dermoscopists need to use all of their acumen to identify small diameter melanomas, which can be invasive. Subtle small melanomas diagnosed on dermoscopy may not be very distinct clinically (so-called 'Little Red Riding Hood' sign).