

Quiz

Basics of Dermoscopy for Beginners

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QUESTIONS

- As a diagnostic tool, dermoscopy can
 - Confirm the clinical diagnosis
 - Refute the clinical diagnosis and suggest/provide an alternate diagnosis
 - Narrow down the differential diagnoses
 - All of the above
- Dermoscopy is useful in all of the below except
 - Locating a desired site for biopsy for optimal histopathological outcome
 - Monitoring the changes in a lesion that may occur over time
 - Determining the precise resection margins in skin malignancies
 - Assessing the treatment response
- Dermoscopy allows visualisation of structures as deep as ____ microns.
 - 10
 - 100
 - 1000
 - 10000
- Following is not a type of illumination mode in a dermoscope
 - Polarised light
 - Non-polarised light
 - Blue light
 - None of the above
- The role of interface fluid is to
 - Reduce the surface reflection
 - Make the surface structures more prominent
 - Make the deeper structures more prominent
 - Make the pigmented structures more prominent
- Disadvantage(s) of contact dermoscopy is/are
 - Possible transmission of infection
 - Blood vessels may not be properly visualised
 - Both A and B
 - Cannot be performed without interface fluid

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7. True about polarised illumination dermoscopy
- Helps in clearer visualisation of deeper structures
 - Cuts off surface glare
 - Does not require interface fluid routinely thus obviating the need for contact dermoscopy
 - All of the above
8. Deeper structures are best visualised with ____.
- Polarised illumination
 - Non-polarised illumination
 - Polarised illumination with interface fluid
 - Non-polarised illumination with interface fluid
9. Following are visualised only in polarised illumination except
- Shiny white orthogonal lines
 - Polychromatic structureless areas (Rainbow phenomenon)
 - Four-dotted clods (White rosettes)
 - Follicular keratotic plugs (comedo-like structures)
10. Not true about 'structures' in dermoscopy
- Structure is an element that has a definite shape and size
 - Structures can have different morphologies
 - Morphology of a structure reflects the tissue involved in the pathology
 - Repeats of a structure form the pattern
11. In the depiction below, which is not a structure?
- | | |
|--|--|
|  <p>a</p> |  <p>b</p> |
|  <p>c</p> |  <p>d</p> |
- a
 - b
 - c
 - d
12. The primary colours observed in dermoscopy are determined by
- The basic chromophores in the skin
 - The refractive index (RI) of stratum corneum
 - Degree of hydration of the skin
 - All of the above
13. Which of the following is not a basic chromophore in the skin?
- Keratin
 - Melanin
 - Carotene
 - Haemoglobin
14. The colour imparted by melanin in dermoscopy depends on
- Its amount
 - Its type (eumelanin or pheomelanin)
 - The size of the melanosomes
 - The level at which it is located
15. The colour imparted by keratin in dermoscopy depends on
- Amount of hyperkeratosis
 - Type of hyperkeratosis (compact orthokeratotic or non-compact parakeratotic)
 - Being admixed with serum, blood, melanin, etc.
 - All of the above
16. White colour in dermoscopy may be due to?
- Dermal fibrosis
 - Calcinosis
 - Absence/reduction in melanin
 - All of the above
17. Colours associated with a vascular lesion may be all except
- Red
 - Bluish-black
 - Greyish-black
 - Brown
18. The colour imparted by deoxygenated blood in dermoscopy would be
- Grey
 - Dusky red
 - Bluish-black
 - Brown
19. Black colour in dermoscopy is imparted by
- Melanin
 - Thrombosed blood vessel
 - Both
 - Neither
20. Brown colour of melanin in dermoscopy reflects its location in
- Stratum corneum
 - The Malpighian layer
 - Papillary dermis
 - Reticular dermis

21. Melanin in upper reticular dermis appears in dermoscopy as
- Black
 - Grey
 - Bluish-grey
 - Bluish-black
22. In dermoscopic parlance, 'pigmented lesion' refers to a
- Lesion with exogenous pigments such as due to tattooing, heavy metal poisoning, etc.
 - Melanocytic and/or melanotic lesion
 - Vascular lesion
 - Xanthomatous lesion
23. Which dermoscopic pattern among the following is the MOST related to a pigmented lesion?
- Pigmented clods and globules
 - Structureless pigmented areas (pigment blotches)
 - Pigment lines in reticular pattern (pigment network)
 - Circumferential or segmental radiating lines with rounded tips (pseudopods)
24. Advantages of using descriptive terminologies for documenting dermoscopic features are all except
- Universally comprehensible
 - Easy to do
 - Gives the description of the features 'as is'
 - Interpretation is not influenced by minor variations in the dermoscopic features
25. False about using metaphoric terminologies in documenting dermoscopic features
- Universally incomprehensible
 - Lengthy and tedious job
 - Depends on one's imagination and perception
 - Interpretation can be influenced by minor variations in the dermoscopic features

ANSWERS

1. d

The essential role of dermoscopy as a diagnostic tool is to add an extra edge to the routine clinical diagnostic exercise for skin lesions. Most of the times, dermoscopy asserts or compliments the clinical diagnosis. On occasions, it might refute the clinical diagnosis and suggest an alternate diagnosis. For some lesions, the dermoscopic diagnostic criteria have been well-established by robust studies which serve conclusive for diagnosis and thereby refute the need for an invasive biopsy. Finally, the list of clinical differential diagnoses following dermoscopy gets certainly narrowed as even if a specific diagnosis is not provided, dermoscopy will give an idea of the tissue involved in the pathology and rule out many unrelated disorders that would have been considered clinically.^[1]

2. c

Apart from the primary diagnostic role, dermoscopy is also indispensable in periodic monitoring skin lesions (e.g. a dysplastic nevus), to assess the treatment response and in dermoscopy-directed biopsy for a fruitful outcome, especially in larger lesions [Figure 1]. Although assessment of perilesional area in skin malignancies may provide some subtle clues of extension, dermoscopy cannot precisely delineate the resection margins.^[1]

3. b

Using polarised illumination, one can visualise features as deep as 100 microns which levels at the upper to mid reticular dermis.^[2]

4. d

Apart from the primary polarised and non-polarised illumination modes, pigment boost, blue light and ultraviolet illuminations are also available in many current-day dermoscopes.^[1,3]

5. a

The three essential principles of dermoscopy are illuminating the skin lesion, enhancing the penetration of the illuminated light and magnification of the light reflected from the skin surface and sub-surface region. While the illumination and magnification are provided by light source and achromatic lenses, respectively, penetration of the incident light on the skin surface into the skin is aided by an interface fluid (such as ultrasound probe gel). In dermoscopy, we come across three interfaces – faceplate of the dermoscope (glass) with a RI of 1.52, the intervening air (RI = 1) and the stratum corneum (RI = 1.55). As the intervening air has a lower RI compared to that of stratum corneum, most of the light incident from



Figure 1: Illustration of dermoscopy directed biopsy in a case of basal cell carcinoma.

the dermoscope gets reflected back or scattered. The use of an interface fluid (with RI closer to that the stratum corneum) reduces the surface reflection and provides with more of the light entering into the skin enabling clearer and sharper visualisation of the features [Figure 2].^[4]

6. c

Contact dermoscopy refers to the technique of visualisation of lesional features with the faceplate of the dermoscope in direct contact with the skin surface. Apart from the obvious risk of infection transmission, the visibility of vessels may be hampered due to the compressive force that blanches the vessels. Although the use of an interface fluid increases the clarity and resolution of the features, it is not an absolute necessity.^[4]

7. d

Polarised illumination dermoscopy employs a source polariser and a detector polariser. The source polariser polarises the light from the source. A part of this light reflects back from the surface while the rest penetrates into the skin and undergoes scattering before getting reflected back. The detector polariser only allows this scattered light reflecting from the skin sub-surface region to enter the eye piece of the dermoscopy while cutting off the surface reflected light. Thus polarised dermoscopy achieves two things – cutting

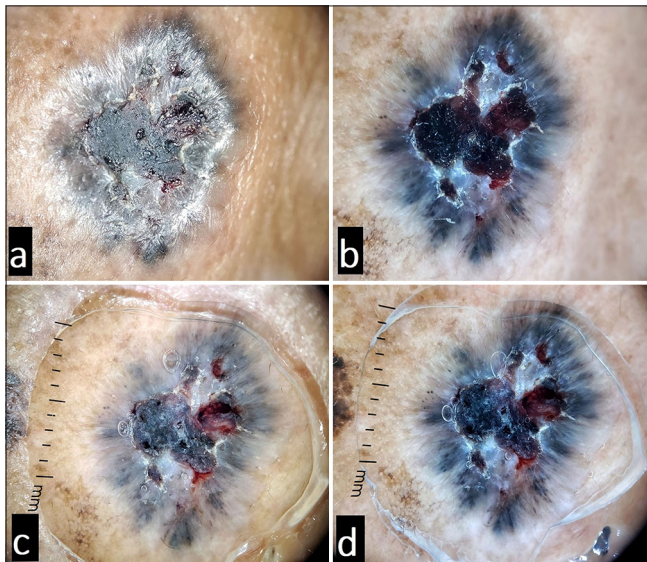


Figure 2: Illustration of the role of immersion fluid in dermoscopy. Panels (a and b) show non-polarised and polarised views, respectively, without linkage fluid. Panels (c and d) show non-polarised and polarised views, respectively, with the use of linkage fluid. Polarised dermoscopy allows clearer visualisation of deeper structures while the non-polarised mode makes the surface features clearly visible. Note how the use of linkage fluid reduces the surface reflection (compare a and c). As the light from the dermoscope is trapped in the fluid, the use of linkage fluid also provides sharper views in both polarised mode (as more of the light is available for penetration into the skin) and non-polarised mode as compared to without using it (compare a and c, and b and d).

off the surface glare to a greater extent and allowing clearer visualisation of the deeper structures [Figure 2]. Although the use of an interface fluid further enhances the clarity and resolution (refer answer 5), it is not an absolute necessity.^[5]

8. c

Refer answers 5 and 7, and Figure 1.

9. d

Apart from clear visualisation of the deeper structures (refer answer 7), polarised dermoscopy exclusively shows certain peculiar features due to optical phenomena. These structures can be seen in many benign and malignant lesions and include the shiny white structures (dots, clods, lines, streaks and structureless areas), four-dotted clods (white rosettes) and polychromatic structureless areas (rainbow phenomenon) [Figure 3]. The shiny white structures (previously called as chrysalis structures) and four-dotted clods (a form of shiny white structure) are seen due to the interaction of polarised light with collagen fibres that have inherent birefringent properties. The polychromatic structureless areas are attributable to the phenomenon of dichroism. A follicular keratotic plug being a skin surface feature is seen with both polarised and non-polarised illumination, although clearer with non-polarised illumination [Figure 4].^[5-7]

10. c

‘Structures’ in dermoscopy (lines, dots, clods, circles and pseudopods) are elements with definite shape and size which may have different morphologies (e.g. a ‘line’ may be straight, curved, looped, coiled, helical, etc.). Multiples of a structure form various patterns (e.g. multiple intersecting lines form the ‘reticular

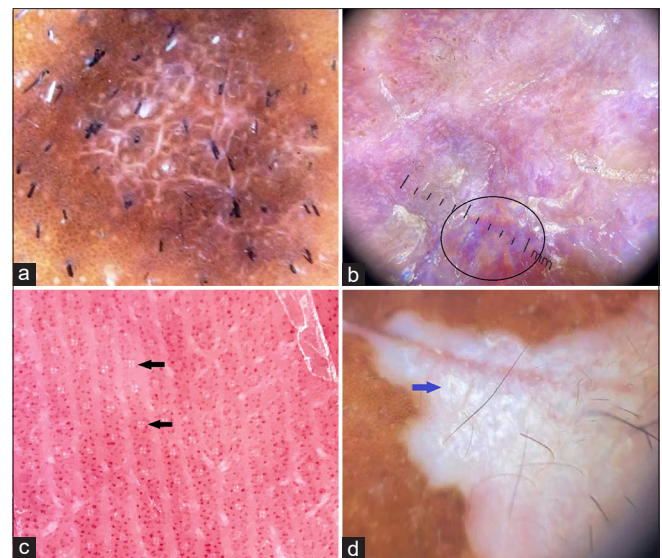


Figure 3: Illustration of optical phenomena specific to polarised dermoscopy: (a) shiny white lines, (b, black circle) polychromatic structureless area, (c, black arrows) four-dotted clods and (d, blue arrow) shiny white structureless areas.

pattern'). The main dermoscopic determinant of tissue involved in the pathology is the colour of the structures as they represent the main tissue chromophores in the skin (refer answer 12).^[8]

11. b

Panels a, c and d in the diagram show the basic structures. Panel b depicts a branching pattern formed by repeats of the lines (refer answer 10).^[8]

12. a

Colours in dermoscopy are possibly the main diagnostic determinants of a lesion. The primary colours observed in dermoscopy are white, black and red imparted by the basic chromophores – keratin, melanin and haemoglobin,

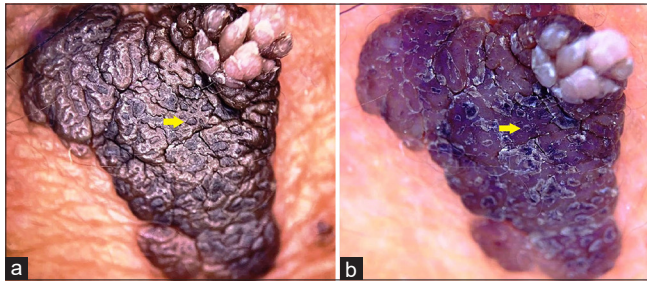


Figure 4: Comedo-like structures (yellow arrows) in seborrheic keratosis “visible both in (a) non-polarised and (b) polarised modes. Being surface features, these structures appear more prominent in non-polarised mode.

respectively [Figure 5]. In practice however, it is important to be aware of two things: (1) The primary colours may not always be depicted by the three basic chromophores (e.g. white colour also represents fibrosis, calcinosis or absence of melanin pigment [Figure 6]; black colour can also be due to thrombosed vessel [refer answer 17 below]) and (2) we observe different colours emitted by the primary chromophores due to various factors such as level of the chromophore (e.g. melanin can appear black, brown, grey and bluish-black when located in the stratum corneum, Malpighian layer, papillary dermis and reticular dermis, respectively [Figure 7]), biological state of the chromophore (e.g. oxygenated and deoxygenated haemoglobin appear bright red and blue-black, respectively) or the amount (e.g. compact orthokeratotic keratin appears yellowish-white and sparse parakeratotic keratin appears white). Hence, it is of paramount importance to interpret the colours in dermoscopy contextually.^[3,8]

13. c

Refer answer 12.

14. d.

Refer answer 12.

15. d

Apart from the yellow and white colours of keratin due to its amount and type of hyperkeratosis (refer answer 12),

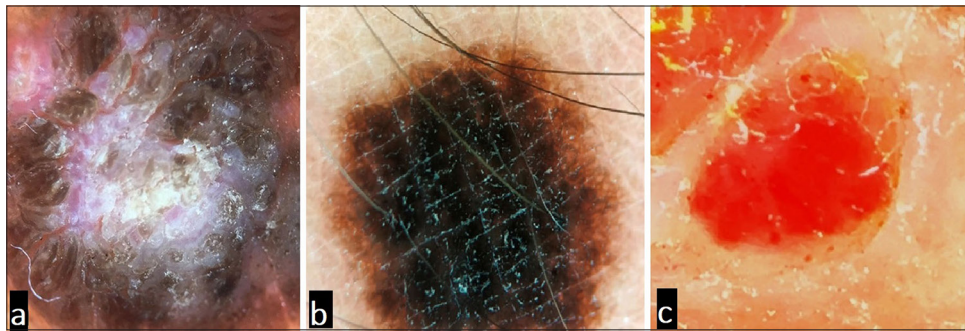


Figure 5: Basic chromophores in the skin: (a) keratin – primarily imparting white color, (b) melanin – primarily imparting black color, and (c) hemoglobin – primarily imparting red color.



Figure 6: White color in dermoscopy due to (a) amelanosis in vitiligo, (b) dermal fibrosis in lichen sclerosis, and (c) calcinosis in pilomatricoma.

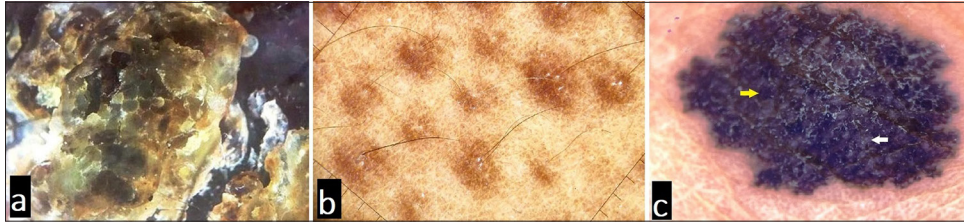


Figure 7: Illustration of various colors of melanin in dermoscopy based on its location: (a) black in stratum corneum, (b) brown in Malpighian layer, and (c) gray (white arrow) and blue (yellow arrow) colors due to its presence in papillary and reticular dermis, respectively.

keratin may appear yellow-orange, red, black or brown being admixed with serum, fresh blood, deoxygenated blood or melanin and haemosiderin or dirt, respectively.^[3]

16. d

Refer answer 12 and Figure 3.

17. c

The colour imparted by a vascular lesion is primarily red due to the haemoglobin. Other colours that may be associated with a vascular lesion are bluish-black (deoxygenated haemoglobin/thrombosed vessel) and brown due to haemosiderin deposits in old lesions indicating a resolved haemorrhage [Figure 8].^[3]

18. c

Refer answer 12 and Figure 7.

19. c

Refer answer 12 and Figures 7 and 8.

20. b

Refer answer 12 and Figure 7.

21. c

Due to Tyndall effect, melanin at various levels in the dermis [Figure 7] appears as grey (papillary dermis), bluish-grey (upper reticular dermis), bluish (mid reticular dermis) and bluish-black (deep reticular dermis).^[3]

22. b

In dermoscopic jargon, 'pigmented lesion' implies a melanocytic (lesions with melanocytic hyperplasia) and/or a melanotic (increased melanin without melanocytic hyperplasia) lesion.^[9]

23. c

Although a pigmented lesion may depict all the patterns mentioned, pigmented lines forming reticular pattern [Figure 9] are prototypical. In the network pattern, the pigmented lines correspond to the melanin in the tips of the rete ridges and the 'holes' in between to the tips of the dermal papillae with relatively less melanisation.^[10]

24. b

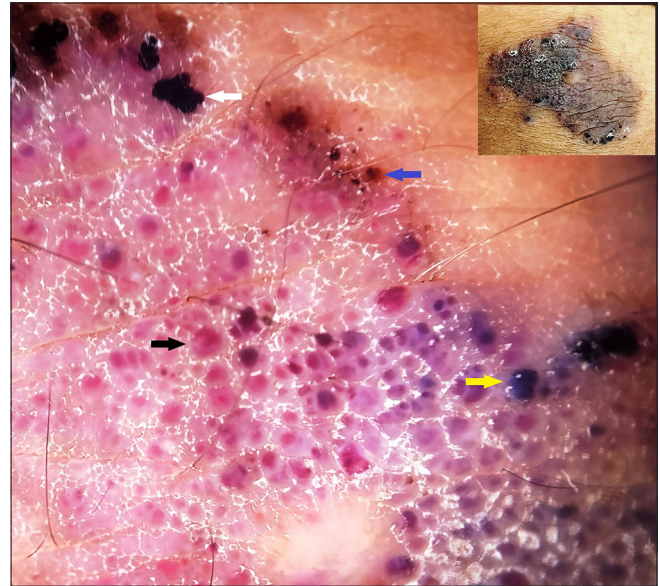




Figure 8: Illustration of various colors of hemoglobin in a vascular malformation: red color of oxygenated hemoglobin (black arrow), black (white arrow) and purple (yellow arrow) colors of deoxygenated hemoglobin, and brown color of residual hemosiderin (blue arrow). Inset – clinical image.



Figure 9: A typical pigment network (brown lines in a reticulate pattern) seen in a non-facial pigmented lesion.

Table 1: Comparison between descriptive and metaphoric analytical approach.

Descriptive analysis	Metaphoric analysis
Description of the features seen 'as is'	Pictorial analogy
Not influenced by variations in features	Variations in features may not match the analogy
Universally comprehensible	Subject to individuals' perception/ imagination, not universally comprehensible
Tedious and lengthy	Easier
Example: 	Example: 
Radial lines converging onto a common center	Spoke-wheel structure

Dermoscopic findings are documented either using descriptive-analytical terminologies or metaphoric analogies or a combination of both. Table 1 outlines the comparison between both techniques. While metaphoric description is easier, a descriptive analysis should be the standard approach.^[1]

25. b

Refer answer 24.

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