A dermoscope is a "stethoscope" for a dermatologist. It is more important to "use" dermoscope than to "learn" it. In the first part of this review, colour and structures of the pigmented lesions on dermoscopy will be elaborated. The important features on dermoscopy to differentiate melanoma from naevus will be discussed. The basic diagnostic approach for pigmented skin lesions will be introduced. It is essential for the readers to continue reading the second part of this review in the next issue in order to get the complete picture about the dermoscopy basics and melanocytic lesions.

**Keywords:** Dermoscope, dermoscopy, melanocytic naevus, melanoma, pigment network

**Introduction**

Do dermatologists need dermoscopy? The answer is, of course, yes! But why? Let's think, first of all, what is special about dermatologists. We all know that we have special eyes for a spot diagnosis of skin disorders, which doctors in other fields may not have. However, patients do not know the difference of the abilities between dermatologists and other doctors. Therefore, we need something special that distinguishes dermatologists from others. A dermoscope could be a special tool for us dermatologists (Figure 1). The dermoscope is not only an essential tool in the diagnosis of pigmented skin lesions, but also an important bridge between a dermatologist and his patient. A competent dermatologist using a dermoscope for examination can impart additional confidence to the patient that his skin lesion has been examined carefully.
Reading points of dermoscopy

The two important features in dermoscopy are colours and structures. These two points are important because they correspond to how the lesion develops and to which depth the lesion occurs at. For example, in melanocytic lesions, they characterise how melanocytes proliferate singly or in a group, or move to the periphery and which depth of the epidermis and dermis they proliferate.

Accordingly, the two important features of dermoscopy that differentiate melanoma from a melanocytic naevus are an asymmetry of colours and an asymmetry of structures, but not an asymmetry of contour (shape) (Figure 2). Everybody would admit that the lesion like Figure 2A is completely symmetrical in terms of colour (brown) and structure (pigment network). However, how about the lesion like Figure 2B? Some may feel a little worried, but this is also completely symmetrical in colour and structure. The reason for anxiety with this lesion is asymmetry of the contour. But it should be borne in mind that, many benign naevi are not completely symmetrical concerning the contour and there is more or less some degree of irregularity. Dermoscopy helps to clarify this point and illuminates the diagnostic features of colour distribution and structural symmetry. Figure 2D also illustrates an example of a benign compound naevus. This lesion demonstrates blue homogeneous colour in the centre and brown typical network at the periphery. The bluish colour means that there are pigmented nests of melanocytes in the upper dermis. Figure 2E also reveals a benign, junctional Clark naevus, showing a homogeneous centre and the typical pigment network at the periphery. However, figures 2C, 2F, 2G and 2H might indicate a beginning of early malignant melanoma, because they exhibit asymmetry of colours and structures.

Basic colours of dermoscopy

Observation with dermoscopy will show five basic colours of black, dark brown, light brown, grey and blue in melanocytic lesions (Figure 3), depending of the depth of the lesions (Figure 4). Other basic colours of dermoscopy include red, yellow and white. A pigmented Spitz naevus demonstrates black starburst pattern, naevi of children mostly exhibit brown globules, whereas a dermatofibroma might show a light brown delicate pigment network and basal cell carcinoma often reveals blue to grey leaf-like areas. Haemangioma would show red-black lacunas, xanthoma demonstrates yellowish homogeneous area and a subepidermal calcified nodule presents as white areas (Figure 3).

Variation of melanocytic naevus

A way of thinking not to miss a melanoma is to know the variations of a naevus. If it is not a naevus, then it might be a melanoma. Other important information is to understand the dermoscopic features of common differential diagnoses. An atypical lesion might be melanoma.

Variations of the melanocytic naevus and the clinico-pathological classification include congenital naevus (Figure 5), naevus of Ota, blue naevus (Figure 6), Miescher naevus (Figures 7 & 8), Unna naevus (Figure 9), Clark naevus (Figure 10) and Spitz naevus (Figure 11). These naevi have their characteristic histology, preferred sites and clinical findings (Table 1).

Basic diagnostic procedures

Diagnostic procedures for pigmented skin lesions include the ABCD rule,¹ Menzies method,² 7-point checklist³ and 2-step procedure adopted by Consensus Net Meeting of Dermoscopy 2000 (CNMD2000).⁴ The CNMD2000 evaluated these four methods and indicated that the 2-step procedure had the highest sensitivity and specificity for the diagnosis of melanocytic lesions. Figure 12 shows the basic algorithm of the 2-step procedure for the dermoscopic classification of pigmented skin lesions (PSL).⁵ The first step is to
Figure 1. Dermoscope is a 'stethoscope' for a dermatologist. It works as a powerful tool not only for diagnosis but also as a bridge between doctor and patient.

Figure 2. Dermoscopy should be based upon colours and structure, but not contour. A, B, C and D are considered as completely symmetrical lesions in terms of colours and structures, but E, F, G and H are not.

Figure 3. Basic colours of dermoscopy. Eight colours are recognised as basic dermoscopy colours. Black, dark brown, light brown, grey and blue are colours corresponding to melanin in each depth in the skin. Red corresponds to blood, yellow to lipid and white to fibrosis, calcium deposition or thick cellular hyperplasia or abscess, etc.

Figure 4. Melanin distribution and dermoscopic colour. The colour seen on dermoscopy depends on the depth of melanin distribution. As a general rule, melanin in the horny layer looks black, brown in the epidermis, light brown in the basal layer, grey in the papillary dermis and blue-grey in the reticular dermis.

Figure 5. Dermoscopy of congenital naevus. Global feature shows reticular pattern composed of typical pigment network at the periphery and regular dots/globules in the centre. Hypertrichosis is a feature of congenital naevus.

Figure 6. Dermoscopy of blue naevus. Global feature shows homogeneous pattern composed of homogeneous blue pigmentation. There is some degree of variation in colour from light blue to dark blue.
**Figure 7.** Dermoscopy of Miescher naevus in children. Global feature shows reticular pattern composed of typical pseudo-network.

**Figure 8.** Dermoscopy of Miescher naevus in adults. Global feature shows globular pattern composed of regular dots/globules and diffuse hypopigmentation.

**Figure 9.** Dermoscopy of Unna naevus. Global feature shows cobblestone pattern composed of regular dots/globules.

**Figure 10.** Dermoscopy of Clark naevus. Global feature shows reticular pattern composed of typical pigment network.

**Figure 11.** Dermoscopy of Reed/Spitz naevus. Global feature shows starburst pattern composed of regular streaks.

**Figure 12.** Two-step procedure for the dermoscopic classification of pigmented skin lesions. The first step is to decide whether the lesion is melanocytic or non-melanocytic. When the lesion is considered as melanocytic, proceed to the second step and decide if the lesion is benign or malignant by pattern analysis. Seb K=seborrhoeic keratosis, BCC=basal cell carcinoma.
make a decision if the lesion is melanocytic or not and to decide if the lesion is a seborrhoeic keratosis, basal cell carcinoma or a vascular lesion. If the lesion is considered as melanocytic or unknown, then one must proceed to the second step and assess one whether the lesion is malignant or benign based on the pattern analysis.

**Criteria for melanocytic lesions**

There are five criteria for melanocytic lesions (Figure 13): (1) pigment network, (2) aggregated globules, (3) branched streaks, (4) homogeneous blue pigmentation, (5) parallel pattern. If one of these criteria is seen on dermoscopy, the lesion would be melanocytic; and, if not, the lesion would be non-melanocytic.

**The shape of pigment network explained by scanning electron microscopy (SEM)**

A Clark naevus shows a reticular pattern with typical pigment network (Figure 14). The network consists of mesh and holes. If the epidermis is removed from the dermis and the dermis is viewed from above, dermal papillae are demonstrated on SEM (Figure 15). Each dermal papilla is considered to correspond to a hole of pigment network on dermoscopy. If the epidermis is examined from the dermal side, mesh-like epidermal rete ridges are also disclosed on SEM (Figure 16). The shape of epidermal rete ridges is equivalent to the pigment network.

**Table 1. Classification of common naevi and characteristic features**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Histology</th>
<th>Frequent site</th>
<th>Clinical finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congenital</td>
<td>Congenital</td>
<td>Compound</td>
<td>Anywhere</td>
</tr>
<tr>
<td>Ota</td>
<td></td>
<td>Dermal</td>
<td>Face</td>
</tr>
<tr>
<td>Acquired</td>
<td>Blue</td>
<td>Dermal</td>
<td>Face, hands</td>
</tr>
<tr>
<td>Miescher</td>
<td></td>
<td>Dermal, mostly</td>
<td>Face</td>
</tr>
<tr>
<td>Unna</td>
<td></td>
<td>Dermal, mostly</td>
<td>Body</td>
</tr>
<tr>
<td>Clark</td>
<td>Junctional/compound</td>
<td></td>
<td>Extremities</td>
</tr>
<tr>
<td>Spitz</td>
<td>Junctional/compound</td>
<td></td>
<td>Face, extremities</td>
</tr>
</tbody>
</table>
Figure 15. Scanning electron microscopy of the dermis. The dermal papillae are demonstrated as papillary projections, which correspond to holes of pigment network on dermoscopy (courtesy of Shuhei Imayama, MD).

Figure 16. Scanning electron microscopy of the epidermis. The epidermal rete ridge is disclosed as mesh-like structure, which is equivalent to pigment network in terms of the shape (courtesy of Shuhei Imayama, MD).

References


