

# Modified pattern analysis helps simplify dermatoscopic elements

## DERMATOLOGY

The use of metaphoric terminology for dermatoscopy reporting has been a barrier to learning. Dermatologist **Amanda Oakley** describes a modified approach



Modified pattern analysis was devised by Austrian dermatologist Harald Kittler. He has pointed out that the complexities of the metaphoric terminology that has evolved for dermatoscopy (conventional pattern analysis) have made the topic difficult for beginners to grasp.

### Elements

The elements of dermatoscopy are coloured lines, dots and clods. Elements are grouped together to form patterns of lines, patterns of dots and/or patterns of clods. Structureless zones are areas with no lines, dots or clods.

### Benign versus malignant

Modified pattern analysis describes benign skin lesions as having symmetrical patterns and few colours. These patterns are absent in malignant tumours, which may have multiple elements and structureless zones of varying colours (Figure 1).

### Colours

Melanin in the superficial epidermis, the base of the epidermis, the papillary dermis and reticular dermis appears black, brown, grey or blue, respectively.

Cutaneous blood vessels are red, purple or blue, depending on their depth within the dermis.

Superficial keratin creates white and yellow structures. White can also be due to dermal scarring. Yellow can also be due to pus.

### Lines

The most common arrangement of brown lines is a network of intersecting lines typical of normal dark skin, of junctional melanocytic naevi (Figure 2) and some lentigos. Naevi on the palms and soles typically form parallel lines that are more pronounced in the furrows than the ridges, sometimes forming a lattice pattern (Figure 3).

Enlarging melanocytic lesions may display radial lines, ie, peripheral outwardly pointing lines, circumferentially in an enlarging naevus (Figure 4) and focally in melanoma (Figure 5).

Circles are joined up lines. Circles around appendageal structures may be white, grey or brown in colour. Concentric circles are a feature of lentigo maligna (Figure 6).

White lines can form a network or be arranged at right angles (nodular melanoma; Figure 7).

Thicker and curved, greyish or brown, parallel lines make up the ridges of many seborrhoeic keratoses (Figure 8), often forming a brain-like or cerebriform pattern, in metaphorical terminology.

Multiple, angulated, black, brown or grey lines make up polygons. These are a feature of melanoma in situ, on a sun-damaged upper back (Figure 9).

Red lines are often branched in basal cell carcinoma (Figure 10). They may also appear curved (in skin-coloured dermal naevi; Figure 11), looped (in skin-coloured seborrhoeic keratosis) or serpiginous (in skin-coloured malignant tumours).

### Dots

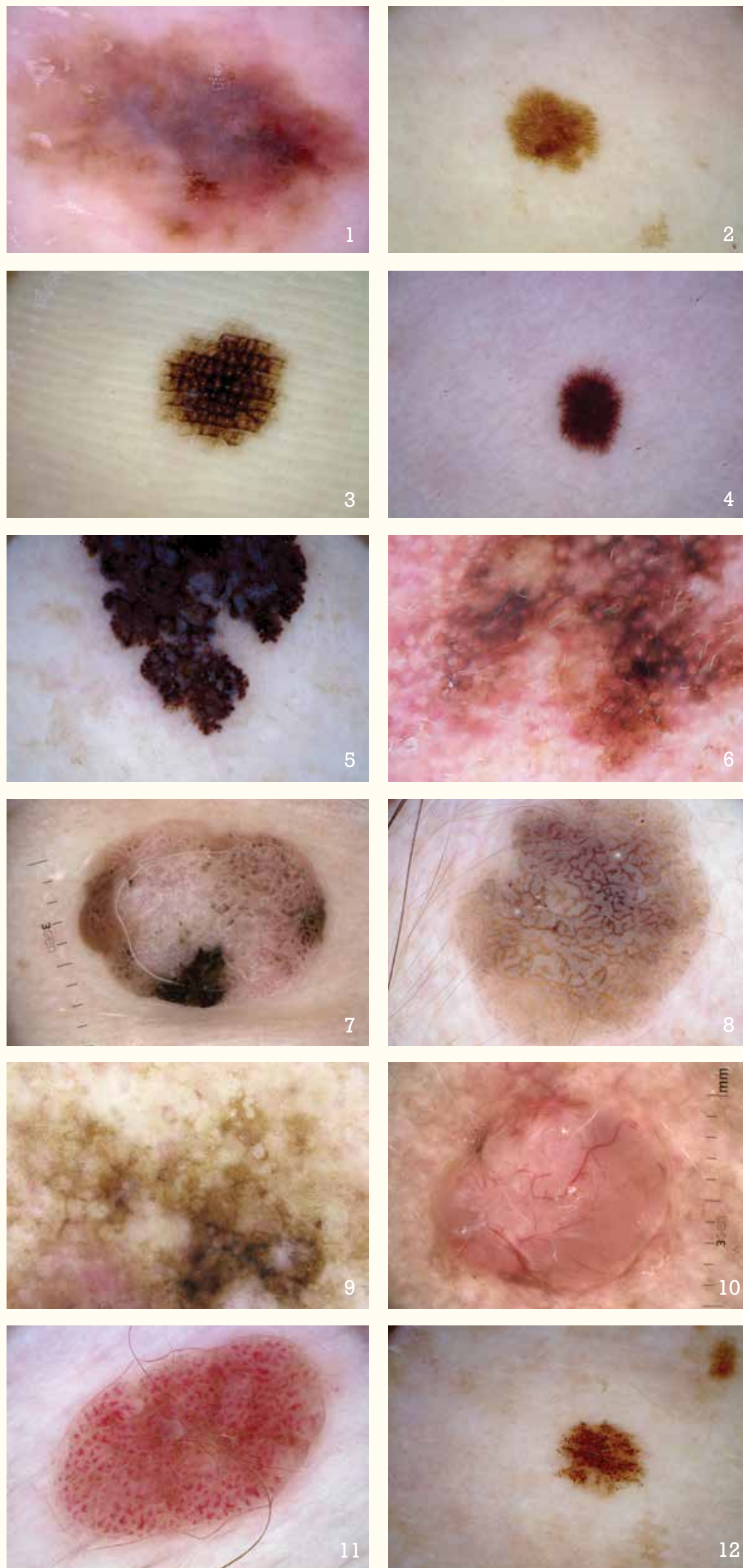
Pigmented dots are due to individual melanocytes or free melanin in the superficial epidermis (black), junctional zone (brown; Figure 12) or papillary dermis (grey, following the destruction of epidermal keratinocytes; Figure 13). Within a skin lesion, dots can be central, peripheral, scattered or clustered.

Red dots represent vertically arranged small blood vessels. They are uniformly scattered in inflammatory lesions (eg, psoriasis; Figure 14) or central (in skin-coloured naevi).

### Clods

Clods are larger than dots and have a discrete, defined shape (any shape). In melanocytic naevi, aggregated clods represent dermal nests of melanocytes and vary in colour

Cutaneous blood vessels are red, purple or blue, depending on their depth



and size (childhood dermal naevus, Figure 15; adult papillomatous naevus, Figure 16). When peripheral (Figure 17), they indicate an enlarging melanocytic lesion.

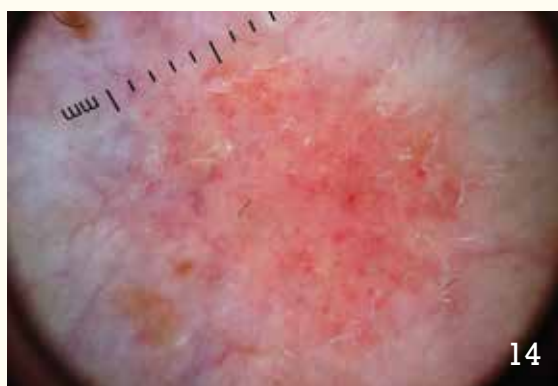
Irregularly scattered superficial clods may be due to

keratinous debris within the crevices of papillomatous naevi (Figure 18) and seborrhoeic keratoses (Figure 19) – comedo-like openings or irregular crypts in metaphorical language. They are predominantly grey, brown,





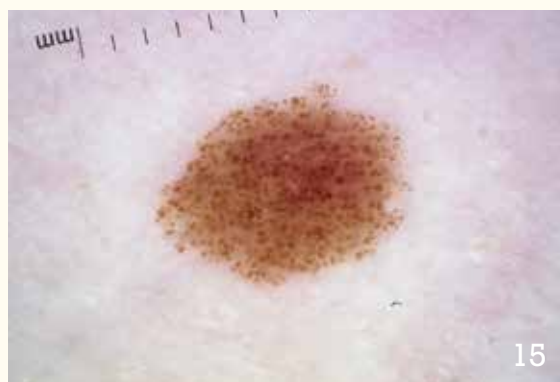
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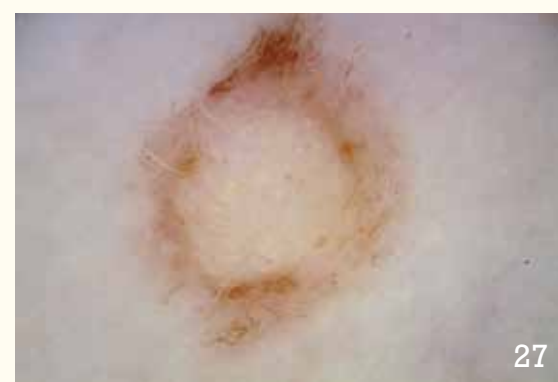
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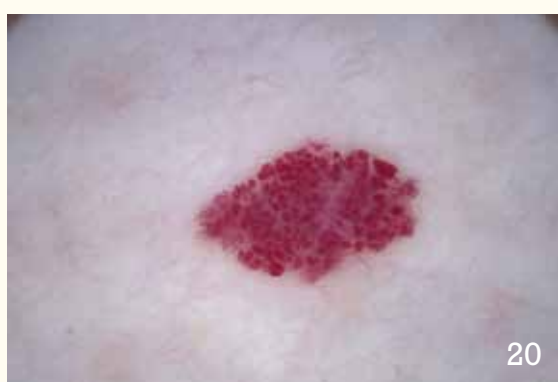
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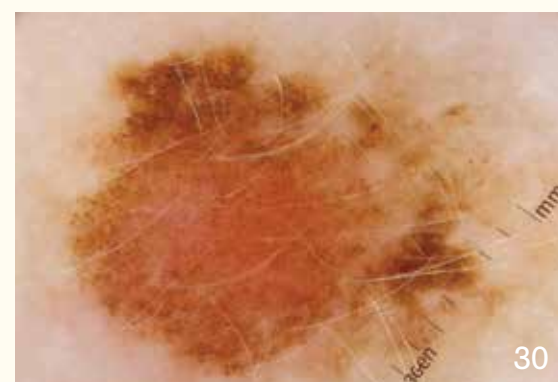
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black or orange.

White or yellow clods – milia-like cysts – are due to whorls of keratin below the stratum corneum (Figure 19).

Red (Figure 20), purple (Figure 21) or blue aggregated clods are characteristic of cherry angiomas and pyogenic granulomas.

Pseudopods are radial lines with a peripheral clod, like a lollipop (Figure 5, arrow).

**Structureless zones**

Structureless zones are defined by a lack of lines, dots or clods. The zones can be any colour: black, light or dark-brown (epidermal melanin; Figure 22), grey, blue (dermal melanin; Figure 23), skin-coloured (dermal nae-

vus; Figure 24), yellow, white (keratin, scarring), red or purple (blood; Figure 25).

**One, two or three patterns**

Many melanocytic naevi have a single pattern, which may be made up of pigmented lines, dots or clods on a lightly pigmented background, or structureless (one colour).

Two distinct patterns are also common. These can occur because two distinct lesions collide (eg, basal cell carcinoma and seborrhoeic keratosis; Figure 26) or because of compound histology (junctional and dermal components). The result is often a pale, structureless centre and a peripheral network of lines on dermatoscopy (Figure 27). Dermatofibromas also often have two components:

a peripheral fine network or structureless zone and a central white area (Figure 28).

Three concentric patterns in a melanocytic lesion form the cockade naevus, with one or other structure in the middle, a structureless intermediate zone and a peripheral pigment network (Figure 29). Some congenital and childhood-onset naevi are made up of multiple structures, but the history of presence at birth or in early childhood and the symmetry of the arrangement of the structures are reassuring (Figure 30). ●

*Amanda Oakley is a specialist dermatologist practising in Hamilton at Waikato Hospital and Tristram Clinic. She is an honorary associate professor at Waikato Clinical School, and website manager for DermNetNZ.org*