Diagnosing basal cell carcinoma: what is the role for dermoscopy?

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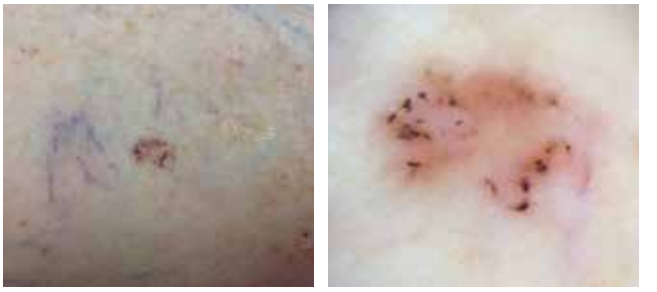
Dermoscopy has a role in the diagnosis of basal cell carcinoma (BCC) and may give clues to discern between superficial BCCs and other subtypes. Histopathology, however, remains the gold standard for diagnosis of these common skin cancers.

Basal cell carcinoma (BCC) is the most common form of skin cancer. Chronic sun exposure appears to be the most important risk factor but there are others, such as fair skin phototype, that play an important role. BCCs usually develop on skin that contains pilosebaceous units, most commonly on the face, but the lesions also occur on locations that are not exposed to the sun. Although it rarely metastasises, a BCC may be locally aggressive and lead to serious morbidity if not correctly diagnosed and treated.

Case presentations

Case 1: Superficial BCC

A 73-year-old woman with no past history of skin cancer presented with a new lesion on her right thigh (Figure 1a). On clinical examination, a brown and pink macule, 1.5 cm in diameter, was observed. The differential diagnosis included BCC, melanocytic naevus and seborrhoeic keratosis. Dermoscopy showed short and thin telangiectasia, incomplete maple leaf-like areas and blue-grey globules (Figure 1b). A biopsy was performed and confirmed a diagnosis of superficial BCC. The patient received nonsurgical treatment with imiquimod 5% (applied five times per week for six weeks). At follow up at three months later, dermoscopy revealed no signs of remnant superficial BCC.



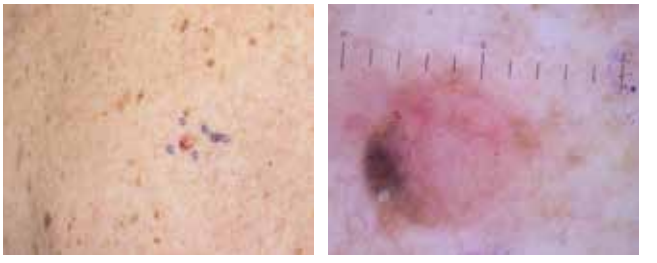
Figures 1a and b. Case 1. a (left). The lesion on the woman's leg at presentation. b (right). Dermoscopy showing short and thin telangiectasia, incomplete maple leaf-like areas and blue-grey globules.

Case 2: Nodular BCC

A 70-year-old woman presented for a full skin check. She had sun-damaged skin and a past history of non-melanoma skin cancer. On clinical examination, a 1 cm shiny papule with telangiectasia and some brown pigment was noted on her back (Figure 2a). Dermoscopy showed arborising telangiectasia and blue-grey ovoid nests (Figure 2b). The findings were suggestive of nodular BCC and the patient was referred for surgical excision of the lesion.

Case 3: Infiltrative BCC

A 51-year-old woman presented with a lesion that had been growing on her left preauricular area for more than a year (Figure 3a). On clinical examination, a 0.8 cm flat, shiny, white and pink lesion with ill-defined margins was noted. Dermoscopy showed multiple thin arborising telangiectasia distributed in a stellate



Figures 2a and b. Case 2. a (left). The lesion on the woman's back at presentation. b (right). Dermoscopy showing arborising telangiectasia and blue-grey ovoid nests.

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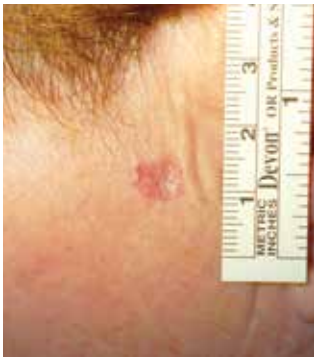
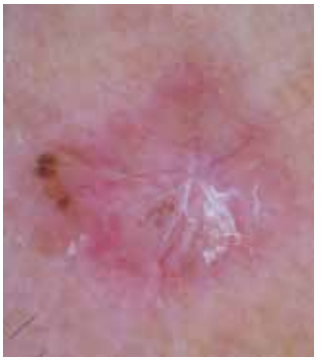
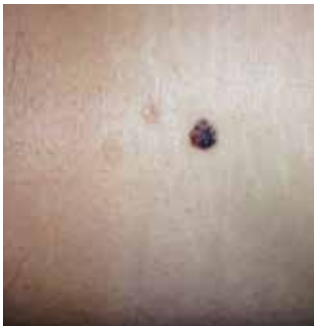
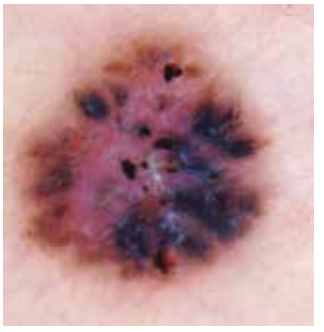



Figures 3a and b. Case 3. a (left). The lesion near the woman's ear at presentation. b (right). Dermoscopy showing multiple thin arborising telangiectasia, white-pink areas, blue-grey dots and concentric brown structures.

Figures 4a and b. Case 4. a (left) The lesion on the man's abdomen at presentation. b (right). Dermoscopy showing milky-red areas, multiple focal ulcerations, blue-grey ovoid nests, chrysalids and brown pigment on the periphery, resembling maple leaf-like areas or concentric structures.

pattern, white-pink areas, blue-grey dots and concentric brown structures (Figure 3b). The dermoscopic pattern was suggestive of an infiltrative BCC, but a diagnosis of melanoma had to be considered because of the brown pigment. After surgical excision, a diagnosis of infiltrative BCC was confirmed by histopathology.

Case 4: Pigmented nodular BCC

A 48-year-old man presented after recently observing a pigmented lesion on his abdomen (Figure 4a). On clinical examination, a 1 cm slightly elevated, shiny and intensively pigmented papule was noted. Dermoscopy showed milky-red areas, multiple focal ulcerations, blue-grey ovoid nests, shiny white streaks and brown pigment was present on the periphery, resembling maple leaf-like areas or concentric structures. No pigment network was observed (Figure 4b). The findings were suggestive of pigmented BCC, but the lesion was excised because melanoma remained a possibility. Histopathology confirmed a diagnosis of pigmented nodular BCC.

Discussion

Diagnosis

Histopathology remains the gold standard for diagnosing BCC and for differentiating BCC subtypes. Dermoscopy is helpful in the diagnosis of BCC and gives clues to discern between superficial BCC and nonsuperficial BCC, which are managed differently. Dermoscopy has been shown to be effective for discriminating BCC from other skin tumours, with a sensitivity of 95 to 97% and a specificity of 87 to 96%.[1-6] The dermoscopic characteristics of BCC are summarised in Table 1.

Subtypes of BCC

There are five major clinicopathological subtypes of BCC: nodular, superficial, infiltrative, morpheaform and fibroepithelial. Several other histopathological subtypes have been identified.[7] Most subtypes of BCCs, particularly nodular BCC, can be pigmented, containing aggregates of melanin, melanocytes and melanophages. Pigmented BCCs are more common in people with olive skin (50% of all BCCs) than in those with fair skin (<10% of all BCCs).[8] For a pigmented BCC, the differential diagnosis must include melanoma and other pigmented lesions such as naevi and seborrhoeic keratoses.[9]

Nodular BCC is the most common subtype of BCC (around 50% of all BCC subtypes) and is usually located on the face. Clinically, lesions appear as pearly papules of pinkish colour with arborising telangiectasia and occasional presence of brown colour or ulceration.

Superficial BCC is most frequently located on the trunk and extremities. Clinically, it presents as a well-defined erythematous plaque with focal scale or ulceration. On some occasions a slightly prominent border may be seen. A superficial BCC initially has a horizontal growth but it may develop an invasive component if not treated.

Infiltrative BCC is usually located on the face. Lesions usually present as pinkish, shiny, flat lesions with arborising vessels and poorly defined margins.

Morpheaform BCC is less common than the previously described subtypes. Lesions are usually located on the face and resemble a scar, presenting as a hypopigmented or pink indurated area of ill-defined margins. Arborising telangiectasia, brown pigment and nodular areas may be present. Desmoplastic melanoma is a differential diagnosis.

Fibroepithelial BCC (Pinkus tumour) is a rare subtype of BCC and tends to occur on the sacral area and lower back.[7] It presents clinically as a pink or skin-coloured pedunculated papule or plaque, resembling a fibroma or an intradermal naevus.

Dermoscopy can give clues to discern between superficial BCC and nonsuperficial BCC. In a 2014 study of dermoscopic

criteria for discriminating superficial BCC from other subtypes of BCC, the most potent predictors of superficial BCC were short fine superficial telangiectasia, maple leaf-like areas, multiple small erosions and shiny white-red structureless areas.[10] The authors found the presence of the first two criteria (short fine superficial telangiectasia and maple leaf-like areas) in the absence of blue-grey ovoid nests, arborising vessels and ulceration to be predictive of superficial BCC with a sensitivity of 81.9% and a specificity of 81.8%. By contrast, the presence of blue-grey ovoid nests, arborising vessels and ulceration increased the probability of nonsuperficial BCC. Blue-grey ovoid nests was the most potent predictor for invasiveness. Brown pigment located in the dermis appears blue (Tyndall effect),[11] so the presence of blue colour in a BCC should indicate that the lesion is located in the dermis and is therefore invasive. However, blue-grey dots or globules are found in both superficial and nonsuperficial BCCs. A flat clinical presentation does not imply that a BCC is superficial: 46.5% of flat lesions were found to be superficial whereas 53.5% were not.[10] The presence of blue-grey ovoid nests, even in a flat lesion, should exclude the diagnosis of superficial BCC and lead to surgical management of the tumour.

A study of BCC subtype classification by means of dermoscopy and reflectance confocal microscopy had similar findings.[12] The most frequent dermoscopic criteria of superficial BCC were superficial fine telangiectasia (70.5%), shiny white-red structureless areas (68.2%) and multiple small erosions (38.6%). Maple leaf-like structures were also a positive criterion for superficial BCC (31.8%). In nodular BCC, arborising vessels were the main feature (86.4%), followed by blue-grey ovoid nests (54.5%) and ulceration (27.3%). In invasive BCC, the most common criteria were shiny white-red structureless areas (72.7%) and arborising vessels (50%) of smaller calibre and less tendency to branch compared with those seen in nodular BCC.[12] Features of superficial BCC and nonsuperficial BCC are summarised in Tables 2 and 3.

In another recent study, a stellate peri-tumour dermoscopy pattern was described as a clue for diagnosis of infiltrating BCC.[13] This dermoscopic feature was defined as a geometric star shaped pattern extending outwards from the circumferential peripheral edge of the tumour, and identified by white lines, vessels or uneven skin surface morphology. It was hypothesised that ulceration, present or past, could be an explanation for this pattern. Further studies are needed to assess the applicability of this dermoscopic feature.[14]

TABLE 1. DERMOSCOPIC FEATURES OF BCC

Absence of pigment network	
Superficial fine telangiectasia	
Linear and arborising telangiectasia	
Maple leaf-like areas on the periphery of the lesion	
Blue-grey ovoid nests or blotches	
Blue-grey dots or globules	
Specks of brown and grey pigment	
Spoke wheel areas (radial projections from a well circumscribed dark central hub)	
Concentric structures (globular-like structures of brown, grey or black colour, with a darker central area)*	
Focal or multifocal ulceration	
Multiple small erosions	
Shiny white-red structureless areas	
Shiny white streaks (chrysalids)†	

* Considered to be precursors of spoke wheel areas.
† Only with polarised dermoscope.

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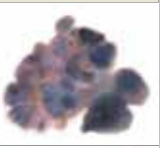
Management

The management of patients with BCC is well described in the Australian guidelines, which includes practical information about decision making for specialist referral.[15] The approach taken to treatment will depend on BCC subtype as well as other factors (e.g. tumour location, size, recurrence after prior excision). Dermoscopy allows a better delineation of margins than naked eye examination and should be used when planning surgery. The first-line treatment for nodular and other invasive BCC subtypes is complete excision with 2 mm margins. Moh's micrographically controlled surgery is recommended for infiltrative BCC on specific

TABLE 2. SUPERFICIAL BCC: DERMOSCOPIC PREDICTIVE FEATURES

Positive predictive features		Negative predictive features	
Maple leaf-like areas		Blue-grey ovoid nests or blotches	
Superficial telangiectasia (short and thin)		Arborising telangiectasia (long and thick)	
Multiple small erosions		Ulceration	

KEY POINTS

- Dermoscopy has demonstrated utility in the diagnosis of BCC. It may also be helpful in discriminating superficial BCC from other subtypes of BCC.
- The presence of blue-grey ovoid nests in a BCC, even if the lesion is flat, should exclude the diagnosis of superficial BCC and lead to surgical management of the tumour.
- For a lesion containing elements of pigment, the differential diagnosis must always include melanoma and other pigmented lesions.
- Dermoscopy can inform decision making about the need to perform a biopsy for a lesion, the best location for the biopsy (sampling where the lesion looks most likely to be invasive) and the margins of the lesion prior to surgery.
- Histopathology remains the gold standard for diagnosis and classification of BCCs.

TABLE 3. MOST FREQUENT DERMOSCOPIC CRITERIA OF BCC SUBTYPES[12]

Superficial BCC
Superficial telangiectasia (70.5%)
Shiny white-red structureless areas (68.2%)
Multiple small erosions (38.6%)
Maple leaf-like areas (31.8%)
Nodular BCC
Arborising telangiectasia (86.4%)
Blue-grey ovoid nests (54.5%)
Ulceration (27.3%)
Invasive BCC
Shiny white-red structureless areas (72.7%)
Arborising telangiectasia (50%)

locations on the face where it is associated with a lower recurrence rate than conventional surgery;[16] further information about Moh's surgery is provided in the Australian guidelines.[15] For invasive BCC where a surgical approach is not possible or when margins are involved after excision the treatment options include radiotherapy and (rarely) imiquimod; these should be discussed in a specialised environment.[17-19] A recently introduced systemic drug targeting the Hedgehog signalling pathway, vismodegib, is available for treatment of advanced or metastatic BCC.[20]

Superficial BCCs may be managed with nonsurgical treatments, such as imiquimod 5%, photodynamic therapy, electrosurgery or cryotherapy, or with second-line treatment with excision.[17-19] For some topical medications, confirmation of the diagnosis by biopsy is a PBS requirement. Patients who have numerous superficial BCCs can be treated with topical medications without the requirement for multiple biopsies. However, pigmented lesions that are suspicious for pigmented BCC but with a differential diagnosis of melanoma will need to be sampled.

Conclusion

Dermoscopy has been shown to be effective for discriminating BCC from other skin tumours, and it can give clues to discern between BCC subtypes. Patients with lesions that are clearly classified as invasive after dermoscopic examination may be referred directly for surgery. In situations where a lesion is clearly classified as superficial by a very experienced dermoscopist and managed with nonsurgical treatment without a previous biopsy, follow up is mandatory to confirm resolution of the lesion. There are important potential pitfalls of not performing a biopsy, such as missing an invasive component of a mixed pattern superficial BCC or a rare collision tumour (BCC and melanoma). In doubtful cases, either a biopsy or surgical excision is required. Melanoma should always be included in the differential diagnosis of a lesion that contains elements of pigment. Key points regarding the role of dermoscopy in the diagnosis of BCC are listed in the Box. MT

References

A list of references is included in the website version (www.medicinetoday.com.au) of this article.

COMPETING INTERESTS: None.

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