

Capillaroscopy in Pigmented Basal Cell Carcinoma Smaller than 3-mm Diameter: A Report of Four Lesions

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Basal cell carcinoma (BCC) is the most common malignant cutaneous neoplasm that predominantly affects the face and neck. Diagnosis of BCC has been greatly improved by dermoscopy, which is associated with high sensitivity and specificity (1, 2). However, when tumours are small in size, classic dermoscopic features, such as large blue-grey ovoid nests, multiple blue-grey globules, and arborizing vessels, are frequently unclear or are only partially present, which makes an accurate diagnosis difficult (4–8). Capillaroscopy (e.g. nailfold video-capillaroscopy, nailfold capillaroscopy, and video-capillaroscopy) has been used to evaluate peripheral circulatory disorders and vascular abnormalities in collagen diseases, such as systemic sclerosis (9). While dermoscopy has a magnification of approximately $\times 10$ to $\times 30$, capillaroscopy (GOKO Bscan-Z; GOKO Imaging Devices Co., Ltd, Kanagawa, Japan, <https://www.goko-camera.com/english/ev/bscan-z.php>) has a remarkable magnification capability in the range of $\times 145$ to $\times 590$, and enables us to observe the morphology of capillaries and measure the blood flow velocity and vessel diameter with high resolution. Moreover, capillaroscopy is a non-invasive examination that can be performed by simply touching the surface. To investigate the usefulness of capillaroscopy for the diagnosis of BCC, 4 lesions less than 3-mm diameter were examined.

METHODS AND CASE REPORTS

Polarized dermoscopy images were obtained using a DZ-D100 (Casio Computer Co., Ltd, Tokyo, Japan, https://dz-image.casio.jp/products/derm/dz_d100.html). Capillaroscopy images were obtained using a GOKO Bscan-Z (GOKO Imaging Devices Co., Ltd). Ethical approval for this study was granted by the ethics commission of Gunma University. All patients provided written informed consent.

Case 1. A 72-year-old Japanese man presented a small brownish nodule on the left cheek. Physical findings showed a 3×2-mm papule on the left cheek (Fig. 1a). Dermoscopic examinations showed relatively uniform brown macules with no vascular structures and a few in-focus blue-grey dots (Fig. 1b). Capillaroscopy examinations revealed homogeneous black or blue-whitish pigmentation and blue-grey dots and arborizing vessels (Fig. 1c, Fig. S1a, b). Wide excision was performed with a 2-mm horizontal margin. A histopathological examination revealed nodular BCC (Fig. S1c).

Case 2. A 76-year-old Japanese man presented with 2×1 mm black nodule on his left cheek (Fig. 1d). Dermoscopic examinations showed homogeneous black-brownish pigmentation (Fig. 1e). Capillaroscopy examinations revealed homogeneous blue-black

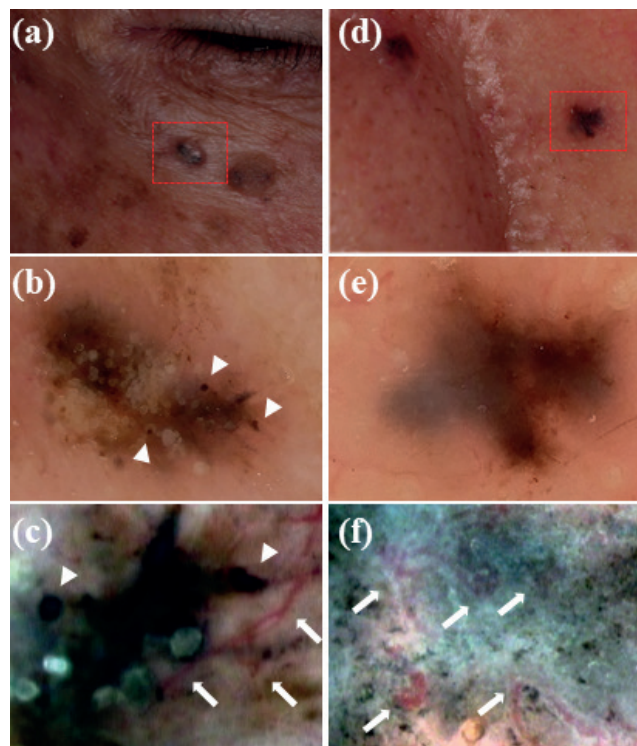


Fig. 1. Clinical, dermoscopic and capillaroscopic features of (a–c) case 1 and (d–f) 2. (a) A 3×2-mm brownish nodule on the left cheek. (b) Dermoscopy showing brown macules, in-focus blue-grey dots (white arrowhead) with scales, and no vascular structures (polarized, magnification $\times 10$). (c) Capillaroscopy showing homogeneous black or blue-whitish pigmentation and black globules (white arrowhead), arborizing vessels (white arrow) (magnification $\times 145$). (d) A 2×1-mm nodule on the left cheek. (e) Dermoscopy showing homogeneous black-brownish pigmentation (polarized, magnification $\times 19$). (f) Capillaroscopy showing tortuous and looped vessels (white arrow) in the pigmentation (magnification $\times 590$).

pigmentation (Fig. 1f). On high magnification, tortuous and looped vessels were observed (Fig. S1d, e). No similar changes were seen in the surrounding area. Surgical excision was performed with a 1-mm horizontal margin. Histopathological findings revealed hyperpigmented nodular BCC (Fig. S1f).

Case 3. An 80-year-old Japanese woman presented with multiple small black macules. Physical examinations showed a 2×1-mm black macule on the left nasal dorsum (Fig. 2a) and a 2×2-mm black macule on the right medial nasolabial sulcus (Fig. 2b). Dermoscopic examinations showed small multiple blue-grey globules, in-focus blue-grey dots, short fine telangiectasia (SFT) (Fig. 2c) and in-focus blue-grey dots, large blue-grey ovoid nests (Fig. 2d), respectively. Capillaroscopic examinations revealed clear blue-grey globules, large blue-grey ovoid nests, blue-grey dots, and arborizing vessels (Fig. 2e, f, Fig. S2a) and multiple blue-grey globules, large blue-grey ovoid nests, tortuous and irregular looped

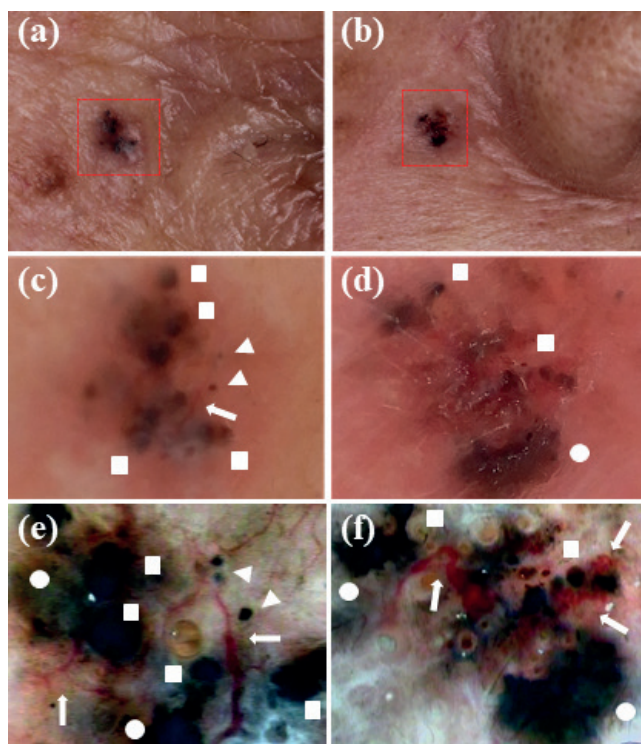


Fig. 2. Clinical, dermoscopic and capillaroscopic features of case 3. (a) A 2×1-mm black macule on the left nasal dorsum. (b) Dermoscopy showing multiple blue-grey globules (white square), in-focus blue-grey dots (white arrowhead) and short fine telangiectasia (white arrow) (polarized, magnification ×10). (c) Capillaroscopy showing clear blue-grey globules (white square), large blue-grey ovoid nests (white circle), blue-grey dots (white arrowhead), and arborizing vessels (white arrow) (magnification ×145). (d) A 2×2-mm black macule on the right medial nasolabial sulcus. (e) Dermoscopy showing multiple blue-grey globules (white square), large blue-grey ovoid nests (white circle) without vascular structure (white arrowhead), and arborizing vessels (white arrow) (magnification ×6). (f) Capillaroscopy revealed multiple blue-grey globules (white square), large blue-grey ovoid nests (white circle), tortuous and looped vessels (white arrow) (magnification ×145).

ped vessels (Fig. S2b–d). Both pigmented macules were excised with a 2-mm horizontal margin. A histopathological examination revealed micronodular and nodular BCC, respectively (Fig. S2e,f).

DISCUSSION

This is the first case series suggesting the usefulness of capillaroscopy in small pigmented BCC. The classic or non-classic dermoscopic features of BCC include arborizing vessels and SFT (3, 10). In all cases, capillaroscopy was able to detect vascular structures that were not clarified or identified by dermoscopy. Arborizing vessels are defined as telangiectasias with tree-like branching, while SFT is defined as short (≤ 1 mm) vessels without tree-like branching (10, 11). In case 3, SFT was clearly observed as tree-like branching of vessels.

Furthermore, not only vascular structures but also pigmented structures such as blue-gray globules and in-focus blue-gray dots, could be clearly observed by capillaroscopy. Capillaroscopy increases the detection rate of classic features and enables a more accurate diagnosis. Whether these findings were specific to BCC,

we examined intradermal naevi case (Fig. S3a–c). Capillaroscopy showed multiple blue gray globules but no distinct vascular structures (Fig. S3d–f). This result suggests that capillaroscopy may be useful in differentiating small BCC.

Only 5 reports regarding the dermoscopic features of small BCC have been published (Table S1). Takahashi et al. (4) reported that arborizing vessels were absent, but multiple blue-gray globules and large blue-gray ovoid nests were frequently observed in small BCC (< 3 mm) (4). Pampena et al. (5) reviewed 12 BCCs (< 5 mm) and reported that arborizing vessels and large blue-ovoid nests were found in 6 and 5 cases. Sanchez-Martin et al. (6) compared 34 BCCs (≤ 3 mm) with 66 BCCs (3.1–5 mm) and reported no significant difference in the dermoscopic features. Popadic et al. (7) reported a higher frequency of arborizing vessels and SFT in larger BCC (> 1 cm). Longo et al. (8) revealed a significant difference in small BCCs (< 5 mm) for pigmented structures, but not for vascular structures. Among our cases, only case 3 had classic dermoscopic features. Because capillaroscopy allows for observation at a higher magnification than dermoscopy, it may be useful in smaller BCCs. In a study of BCCs (< 5 mm), arborizing vessels were observed in less than half of the cases (5, 6, 8). However, in smaller pigmented BCCs (< 3 mm), it may be difficult to confirm the specific vascular structure by dermoscopy. Furthermore, tortuous and irregular looped vessels were seen in Cases 2 and 3. SFT and hairpin vessels on dermoscopy can be visualized as tortuous and irregular looped vessels on capillaroscopy.

To date, there has only been one report on the use of capillaroscopy for BCC. Newell et al. examined BCC by capillaroscopy (magnification: $\times 77$) and quantitatively compared the vascular structures of BCC to control skin or actinic keratosis (12). Although it was not used for diagnostic purposes, their findings were consistent with our study in that tortuous and looped vessels were increased in BCC. BCC frequently develops on the face and neck and may occur as multiple lesions (13). Therefore, the detection of smaller and earlier BCC by capillaroscopy can lead to less-invasive surgical resection. In addition, capillaroscopy is completely non-invasive and can be used easily and quickly at the bedside. Capillaroscopy can be a new diagnostic tool for smaller lesions of pigmented BCC.

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