

Effect of tumor size on dermoscopic features of pigmented basal cell carcinoma

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Basal cell carcinoma (BCC) is the most common malignant tumor of the skin and the incidence increases yearly worldwide. Most BCC is an indolent kind of tumor, it can grow into a large lesion and lost its classic performance. In addition, giant BCC has attracted the attention of researchers in recent years.^[1] Thus, BCC with a large tumor size also catches our attention. Dermoscopy is a useful adjuvant tool for the diagnosis and management of BCCs.^[2] There are few literatures on BCC tumor size and BCC dermoscopic features. We observed and analyzed 98 cases of BCCs and found that dermoscopic features of BCCs ≥ 1 cm in diameter were different from that of smaller BCCs.

We performed a retrospective analysis on cases of BCC confirmed by pathological examination in the Dermatology Department of Beijing Luhe Hospital from January 2017 to January 2020. The Ethics Committee of Beijing Luhe Hospital approved this study (No. 2020-LHKY-013-02). All patients signed written consent forms.

The skin lesions of BCCs were examined using a non-contact polarizing electronic dermoscope workstation (Jiangsu Jieda, China). Clinical and dermoscopic images were acquired by the workstation and stored in the study database (Microsoft ExcelTM, Microsoft Corporation, Redmond, WA, USA). Two independent observers made a retrospective analysis of the dermoscopic images and assessed the presence of dermoscopic features included (1) multiple blue-gray globules, (2) large blue-gray ovoid nests, (3) spoke-wheel areas, (4) maple leaf-like areas, (5) concentric structures, (6) blue-gray dots, (7) arborizing vessels, (8) superficial fine telangiectasia, (9) shiny white-red structureless areas, (10) short white streaks/chrysalis, (11) multiple small erosions, (12) ulceration, and (13) large blue-gray structureless areas. We defined the last feature as a large blue-gray patch on the peripheral region which was different from the features aforementioned.

According to the literature, 98 cases of BCCs were categorized according to the size of BCC as small (<1 cm) and large (≥ 1 cm).^[3,4] Skin lesions were also classified according to the extension of dermoscopic pigmentation at a 20-fold magnification as follows: lightly pigmented BCCs, showing pigmented areas involving $<30.0\%$ of the lesion; pigmented BCCs, displaying pigmented areas involving 30.0% to 70.0% of the lesion; and heavily pigmented BCCs, characterized by the presence of pigmentation in $>70.0\%$ of the lesion. Individual clinical data were also collected at the same time. Statistical analysis was conducted by SPSS22.0 software (IBM Corp, Armonk, NY, USA), and the count data were tested by Chi-squared test or Fisher exact test. *P* values of <0.05 were considered statistically significant.

We included 98 BCC patients with different proportions of pigmentation with a mean age of 65.4 ± 12.9 years. Forty-eight (49.0%) BCCs were >1.0 cm and 50 BCCs (51.0%) between 1.0 and 6.0 cm.

We compared relevant dermoscopic features in BCCs ≥ 1 cm with those in <1 cm small BCCs. Blue-gray dots (33, 66.0%), arborizing vessels (32, 64.0%) ($P < 0.05$), and short white stripes/chrysalis like structures (29, 58.0%), ulcerations (28, 56.0%), and large blue-gray structureless areas (28, 56.0%) ($P < 0.001$) were significantly more frequent in the group of large BCCs compared with the small BCCs [Table 1].

We further classified the two BCC size groups according to the extension of pigmentation. We found that arborizing vessels and large blue-gray structureless areas were more likely to appear in large BCCs compared with small BCCs in the pigmented subgroups. In the heavily pigmented group, the large BCCs were more likely to spot out large blue-gray structureless areas, short white stripes/chrysalis structures, and ulceration.

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Table 1: Proportion of dermoscopic features according to an extension of pigmentation in different sized BCCs (%).

Dermoscopic features	BCC <1 cm				BCC ≥1 cm			
	<30.0% (n = 15)	30.0%–70.0% (n = 20)	>70.0% (n = 13)	Total (n = 48)	<30.0% (n = 16)	30.0%–70.0% (n = 20)	>70.0% (n = 14)	Total (n = 50)
Blue-gray globules	40.0	55.0	53.8	50.0	50.0	60.0	42.9	52.0
Blue-gray ovoid nests	26.7	55.0	76.9*	52.1	43.8	65.0	78.6	62.0
Maple-leaf like structure	13.3	40.0	30.8	25.0	31.3	15.0	28.6	28.0
Spoke wheel-like structures	13.3	25.0	0	14.6	25.0	5.0	0	10.0
Concentric structure	13.3	20.0	15.4	16.7	18.8	10.0	7.1	12.0
Gray-blue dot	33.3	50.0	38.5	41.7	68.8	75.0	50.0	66.0
Arborizing vessels	40.0	45.0	46.2	43.8	31.3	80.0 [‡]	78.6	64.0
SFT	53.3	10.0*	23.1	27.1	62.5	30.0	21.4 [‡]	38.0
Shiny white-red structureless areas	20.0	20.0	0	14.6	25.0	10.0	0	12.0
Short white streaks/chrysalis	20.0	45.0	15.4	29.2	50.0	45.0	85.7 [‡]	58.0 [§]
Erosion	26.7	20.0	15.4	20.8	25.0	35.0	42.9	34.0
Ulcer	33.3	20.0	15.4	22.9	50.0	45.0	78.6 [‡]	56.0 [§]
Big blue-gray structureless areas	6.7	20.0	30.8	18.8	18.8	65.0 ^{‡,‡}	85.7 ^{‡,‡}	56.0 [§]

*P values for comparison of statistical difference with <30% pigmented group for <1 cm BCCs ($P < 0.05$). [†]The P values for comparison of statistical difference with <30% pigmented group for ≥1 cm BCCs ($P < 0.05$). [‡]The P values for comparison of statistical difference for the same extension of pigmentation between <1 and ≥1 cm BCC ($P < 0.05$). [§]The P values for comparison of statistical difference for the total individual dermoscopy character between <1 and ≥1 cm BCC ($P < 0.001$). ^{||}The P values for comparison of statistical difference for the total individual dermoscopy character between <1 and ≥1 cm BCC ($P < 0.05$). BCCs: Basal cell carcinomas; SFT: Short fine telangiectasia.

The comparison between the large and small BCCs showed that tumor development affected dermoscopic features, particularly tumor vascularization, ulceration, fibrosis, and pigmentation distribution. Accordingly, arborizing vessels, ulceration, short white streaks/chrysalis, blue-gray dots, and large blue-gray structureless areas were statistically more frequent in the large group BCCs. Our results differ somewhat from other studies. Popadić and Vukićević^[3] reported that arborizing vessels, short fine telangiectasia (SFT), and multiple small erosions were significantly more frequent in BCCs 1.1 cm or larger in diameter compared with BCCs 1 cm or smaller in diameter. They did not find any change of pigmented structure within the two groups of BCCs. Emiroglu *et al*^[4] reported that a positive correlation existed between the diameter of the lesion and the presence of blue-gray ovoid nests. We did not find this difference of blue-gray ovoid nests between small BCCs and large BCCs, but we identified the difference of large blue-gray structureless areas and blue-gray dots between the two groups.

It is important to note that pigmentation has a prominent effect on dermoscopic features of BCC. To rule out the effect of pigment, we examined the dermoscopic features of the large BCCs and small BCCs within specific pigmented groups. We found that arborizing vessels and large blue-gray structureless areas were more likely to appear in large BCCs compared with small BCCs in the pigmented subgroups. In the heavily pigmented subgroups, the large BCCs were more likely to spot out large blue-gray structureless areas, short white stripes/chrysalis structures, and ulceration. When the large blue-gray structureless areas grew bigger and combined with short white streaks/chrysalis, it could show a blue-white variant, which was difficult to differentiate from melanoma.^[5] Our study and the reports mentioned above reveal pigmentation and tumor size have prominent effects on dermoscopic features of BCC.

The large blue-gray structureless areas we named in our study are diffuse patches, and this structure cannot be explained by other pigment structures mentioned above [Supplementary Figure 1, <http://links.lww.com/CM9/A607>]. We assume that the large blue-gray structureless areas arise from the integration of large blue-gray ovoid nests, because we found atypical blue-gray ovoid nests or leaf-like structures around the large blue-gray structureless areas. About 56.0% of BCCs showed large blue-gray structureless areas in the large BCC group, and the percent was close to that of blue-gray ovoid nests. We think that large blue-gray structureless areas are an important dermoscopic feature of large BCCs. It can be an important clue for large BCCs.

To conclude, with the growth of the tumor, tumor size affected several dermoscopic features of pigmented and heavily pigmented BCC to different degrees. Large blue-gray structureless areas may be an important feature in the diagnosis of large BCCs. Our result is useful to diagnose the large BCCs with atypical clinical lesions by dermoscopy.

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Conflicts of interest

None.

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