

Basal Cell Carcinoma with Matrical Differentiation

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Basal cell carcinoma (BCC) may exhibit diverse differentiation. In BCC with matrical differentiation, islands of shadow cells, which are characteristic of a pilomatricoma, are located within the tumor. This is an extremely rare variant and to our knowledge, only two review articles and one case report have been published. We recently experienced a case of BCC with matrical differentiation in a 45-year-old Caucasian male. This tumor should be differentially diagnosed from other tumors, particularly a pilomatricoma and pilomatrix carcinoma.

Key Words: Basal cell carcinoma, matrical differentiation, shadow cells

INTRODUCTION

Basal cell carcinoma (BCC) may show diverse differentiation, a hair structure, sebaceous glands, and tubular glands. Four additional uncommon histological variants have been described: an adamantinoid type, a granular type, a clear cell type, and a type with matrical differentiation.¹ In BCC with matrical differentiation, islands of shadow cells, which are characteristic of a pilomatricoma, are located within the tumor.¹ This is an extremely rare variant and to our knowledge, only two review articles^{2,3} and one case report⁴ have been published. We report a case of BCC with matrical differentiation in a Caucasian male.

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CASE REPORT

A 45-year-old Caucasian male presented with a rice-sized scaly papule (1.0 × 0.8 cm) on his left arm (Fig. 1) with a one year duration. He was an office worker. A punch biopsy was performed under a clinical impression of either actinic keratosis or psoriasis vulgaris. Complete excision of the lesion was performed after the pathological diagnosis was made.

Histopathological findings

The tumor was composed of basaloid cells arranged in lobules of various sizes and shapes in the upper dermis (Fig. 2A) with a connection to the epidermis. Retraction clefts were visible between the aggregates of neoplastic cells and the surrounding desmoplastic stroma. Nuclear palisading was noted at the periphery of the lobules.

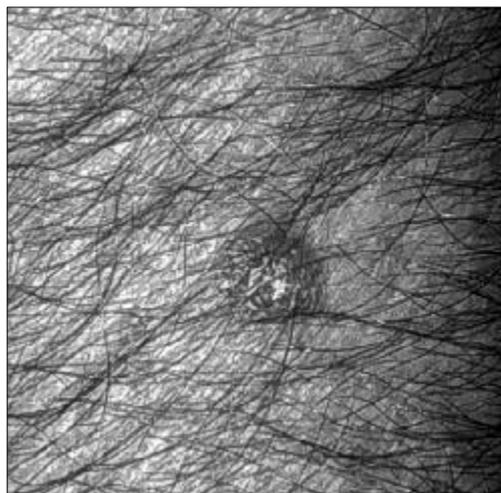


Fig. 1. A scaly papular lesion, measuring 1 × 0.8 cm in the forearm.

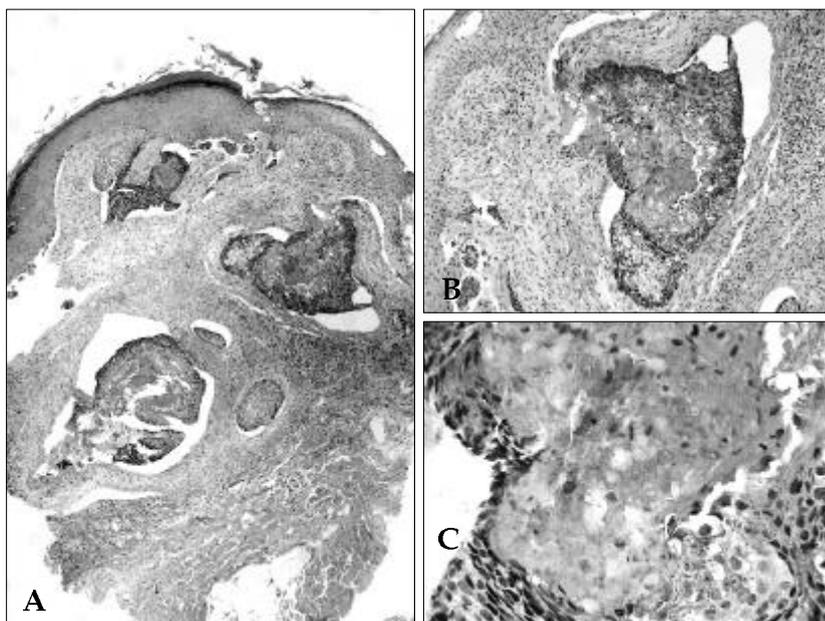


Fig. 2. A. Lobules composed of basaloid cells with nuclear palisading in the upper dermis are seen at low magnification (H & E, $\times 40$). B. Shadow cell nests can be seen in the center of the lobules (H & E, $\times 100$). C. An abrupt transition from basaloid cells to shadow cells can be seen at high magnification (H & E, $\times 200$).

A meticulous search of the entire tumor revealed a single mitosis. No evidence of anaplasia was found. These findings were well matched with those of typical BCCs. However, the basaloid lobules also contained central shadow cell nests that are typically seen in a pilomatricoma (Fig. 2B). The transition from basaloid cells to shadow cells was rather abrupt (Fig. 2C).

DISCUSSION

Shadow cells are indicative of differentiation toward the pilar matrix, which is generally confirmed by electron microscopy.¹ They are typically present in a pilomatricoma, but they have also been described in the hair shaft of alopecia areata, a proliferating trichilemmal tumor, a trichilemmal cyst, a chondroid syringoma, an epidermal cyst of Gardner's syndrome, and other rare unclassified hair follicle neoplasms.² The presence of shadow cells has been assumed to represent a faulty attempt at hair shaft formation.⁵ Ackerman⁶ briefly described that BCC may show superb follicular differentiation i.e. discernible features of the outer sheath with peripheral columnar cells arranged in a palisading pattern and typified by a clear cytoplasm, an inner sheath with trichohyalin granules and blue-gray

corneocytes, and hair expressed imperfectly as "shadow cells". Aloji, et al,² Ambrojo, et al.³ and Kwittken⁴ reported subsequently the presence of shadow cells in BCC (Table 1). Histologically, these cases exhibited shadow cells in addition to the typical features of BCCs. Ambrojo, et al.³ suggested that BCC with matrical differentiation may represent an intermediate stage of differentiation between a pilomatricoma and a pilomatrix carcinoma, as in the subgroups of sebaceous neoplasms: a sebaceous adenoma, BCC with sebaceous differentiation, and a sebaceous carcinoma.³ Kwittken⁴ reported a case of BCC showing shadow cells with extensive acantholysis. He suggested that the shadow cells represented an abnormal mode of cell death through faulty keratinization, and depending on their locale, may either be indicative of hair or nail-plate differentiation, or they may represent a mode of cell death from a squamous metaplasia. He believed that the terminology-'matrical' is nonspecific and ambiguous. Therefore he recommended that BCCs with matrical differentiation be called shadow cell BCCs with the understanding that the shadow cells are indicative of follicular differentiation. The clinical data and prognosis of this tumor is not well known due to the small number of reported cases. It is interesting to note that two out of the reported nine (including our case) cases of BCC

Table 1. Reported Cases of BCC with Matrical Differentiation

Source	Sex/age	Location	Duration (years)	Size(cm)	Clinical presentation	Clinical diagnosis	Treatment	Follow-up (years)
Aloi, et al.	F/79	Forearm	6	1 × 1.5	Nodule-ulcerative	Epithelioma	Excision	4
Aloi, et al.	M/62	Lumbar area	10	5 × 10	Plaque	?	Excision	3
Aloi, et al.	M/72	Temporal area	1	1 × 1	Nodule-ulcerative	BCC	Excision	3
Ambrojo, et al.	M/73	Forehead	20	0.8 × 0.8	Dome-shaped papule	BCC	Excision	1
Ambrojo, et al.	M/64	Forehead	4	0.5 × 0.5	Papule	BCC	Excision	3
Ambrojo, et al.	F/63	Forehead	1	2 × 1	Nodule	BCC	Excision	8
Ambrojo, et al.	F/60	Preauricular area	2	1 × 1.5	Nodule	BCC	Excision	6
Kwittken	M/64	Temple	1	0.8 × 0.8	Papule-ulcerative	?	Excision	?
Present case	M/45	Forearm	1	1 × 0.8	Scaly papule	Actinic keratosis or psoriasis vulgaris	Excision	0.5

BCC, Basal cell carcinoma.

with matrical differentiation were located in the forearm because the incidence of BCC arising in the limbs is very low (about 4%),⁷ and BCCs occur predominantly on the face.¹ According to previous reports, a recurrence or distant metastasis did not occur in any of the cases. In conclusion, one should take into consideration that a matrical differentiation may be observed in BCC. This means that this variation should be differentially diagnosed from adnexal tumors, particularly a pilomatricoma and pilomatrix carcinoma. Histologically, this case differs from these tumors due to the absence of basaloid cells resembling normal hair matrix cells, the presence of a peripheral palisading of basaloid cells with a stromal retraction artifact, the absence of a foreign body reaction, and the presence of connections to both the epidermis and the infundibula.⁴

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