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CASE REPORT

Cutaneous junctional melanocytoma in a dog: Clinical, cytological, histopathological and immunohistochemical evaluation

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ABSTRACT

A 4-year-old Rottweiler dog had a black, firm nodule noticed in the dorsal aspect of a paw region in the periungual region at the nail bed/nail fold area of the paw. Cytology revealed brownish-black pigments dispersed throughout the cytoplasm and histopathology revealed melanocytic cells extending from the dermo-epidermal junction into the deep dermis with melanin granules. Immunohistochemistry confirmed strong Melan-A expression.

Keywords: Cytology, dog, histopathology, immunohistochemistry, junctional melanocytoma

INTRODUCTION

Melanocytomas are benign neoplasms originating from melanocytes. In dogs, these tumors commonly noticed on haired skin with a predilection for areas such as the head, limbs and trunk, particularly in middle-aged to older animals. These tumors are well-circumscribed and slow-growing and rarely metastasize. After excision, melanocytomas have a better prognosis, with a low likelihood of local recurrence or systemic spread[1,2]. Cytologically, the cytoplasm often have abundant coarse melanin granules, which appear brownish-black or blue-green on Romanowsky-stained smears. Mild to moderate anisocytosis and anisokaryosis with eccentrically placed nuclei and prominent nucleoli are observed[1,3]. Melanophages—macrophages containing phagocytosed melanin—may also be observed in the background. Diagnostic challenges, particularly in amelanotic variants lacks visible pigment and may mimic other round cell tumors[4].

Grossly, melanocytomas in dogs present as solitary, dome-shaped, raised and well-demarcated nodules. The surface of the tumor is darkly pigmented, appearing black, brown, or grey and lesions are firm and non-ulcerated. These tumors are commonly observed on the head, neck and distal limbs, which are the common anatomic sites for melanocytic neoplasms in dogs[2,5]. Histopathological assessment is necessary for definitive diagnosis. Melanocytomas present as lobulated clusters or nests of neoplastic melanocytes from the dermo-epidermal junction and extending into the superficial and deep dermis. These cells revealed round to oval nuclei, prominent basophilic nucleoli and varying degrees of cytoplasmic melanin[2]. Immunohistochemistry (IHC), melanocytic markers Melan-A, PNL2, TRP-1/TRP-2 and SOX-10 are commonly used. Melan-A and PNL2 have high specificity and sensitivity in canine melanocytic tumors[3,6,7].

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MATERIALS AND METHODS

A 4-year-old male Rottweiler dog was presented with a history of mass in the dorsal aspect of right forelimb in the periungual region adjacent to the nail bed for clinical diagnosis and treatment. Excisional biopsy was performed and the tissue

samples were collected in 10% formalin, processed by routine paraffin embedding method, cut sections were stained by haematoxylin and eosin and subjected to histopathological studies[8]. For immunohistochemical studies, the tissue samples were processed by routine paraffin embedding method and the cut sections were treated with specific marker - Melan-A.

RESULTS

Gross examination revealed a solitary, well-defined, raised, dome-shaped nodule that was distinctly pigmented. The lesion was firm to the touch and clearly demarcated from the surrounding tissues and exicsed mass measured less than 1.8 cm in diameter (Fig.1)

Cytological assessment of the lesion through fine-needle aspiration smears revealed the presence of numerous multinucleated round to oval cells. These cells were abundant, coarse, granular, brownish-black pigments consistent with melanin and dispersed throughout the cytoplasm. The nuclei were eccentrically placed and prominent nucleoli were noticed (Fig.2).

Dermatohistopathological evaluation supported the cytological findings. The sectioned tissue revealed a multilobulated tumor composed of nests and clusters of melanocytic cells extending from the dermo-epidermal junction into the deeper layers of the dermis. The cells showed round to oval nuclei with defined basophilic nucleoli and melanin granules throughout the lesion (Fig.3).

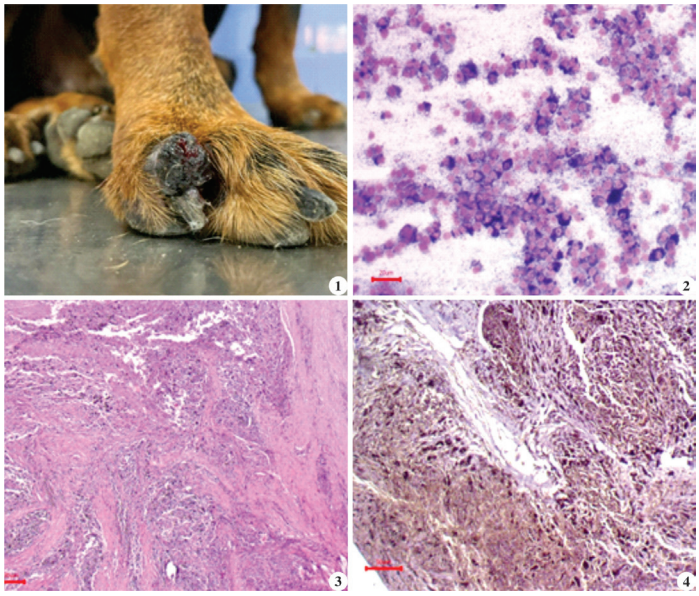

Fig.1. Dog – Melanocytoma – Black, oval, raised nodule in paw; **Fig.2.** Dog – Melanocytoma – Cytology - Granular melanin pigment in the cytoplasm (LG X200); **Fig.3.** Dog – Melanocytoma – HP - Presence of melanin deposition in the deeper part of dermis (H&E X40); **Fig.4.** Dog – Melanocytoma – IHC - Melan A has strongly expressed (H&E X100)

Immunohistochemical examination revealed the neoplastic cells showed strong cytoplasmic expression for Melan A (Fig.4). The strong expression of Melan A in the cytoplasm of the tumor cells confirmed their origin from melanocytes and reinforced the diagnosis of melanocytoma.

DISCUSSION

In the present study, a 4-year-old male Rottweiler with the lesion on the right metacarpal region was noticed, which was known to be the characteristic of melanin tumors. The firm consistency, pigmented appearance and localized nature of the mass are classic features of cutaneous melanocytoma[2,4]. In the current case, fine-needle aspiration revealed such features, with the added presence of coarse melanin granules within the cytoplasm these were in accordance with the presence of melanin pigment was a characteristic diagnostic feature[1,9]. Histologically, melanocytomas consist of lobulated nests of melanocytic cells extending from the dermoepidermal junction into the deeper dermis. In this case, the lesion exhibited a characteristic multilobulated junctional melanocytoma architecture, with prominent melanin deposition and identifiable mitotic figures[10,11] who also observed the importance of histologic depth and mitotic index in prognostic evaluation. Immunohistochemistry (IHC) serves as a useful tool to confirm melanocytic origin, particularly when differentiating from other round cell tumors. Melan A, a melanocyte-specific marker, showed strong cytoplasmic positivity in the neoplastic cells. Melan A has shown to have high grade specificity than markers like S-100 or PNL2[3,12].

CONCLUSION

The characteristic features of heavily pigmented melanocytic cells, multilobulated junctional architecture on histopathology and strong cytoplasmic Melan-A immunoreactivity confirmed the melanocytic origin and nature of the lesion. İt provides the diagnostic value of an integrated approach for accurate identification of canine melanocytic tumors and differentiation from other pigmented cutaneous neoplasms.

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