Received: 30 July 2020 | Revised: 3 October 2020 | Accepted: 28 October 2020

DOI: 10.1111/vcp.12939

Veterinary Clinical Pathology
An International Journal of Laboratory Medicine
WILEY

What is your diagnosis? Fine-needle aspirate biopsy from a skin mass on the distal metatarsus of a dog

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1 | CASE PRESENTATION

A 12-year-old female neutered, black, standard poodle was presented to the referring veterinary surgeon for a firm, hairless skin mass on her distal metatarsus. There were no other clinical abnormalities at the time of presentation. A single smear was prepared from a fine-needle aspirate biopsy of the lesion was submitted to Veterinary Diagnostic Services, University of Glasgow for cytologic evaluation (Figure 1 and 2).

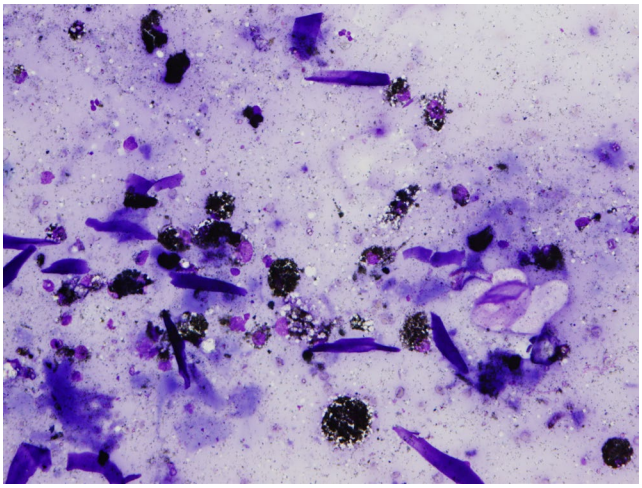

FIGURE 1 Representative photographs of the metatarsal lesion. May-Grünwald Giemsa stain, ×40 objective

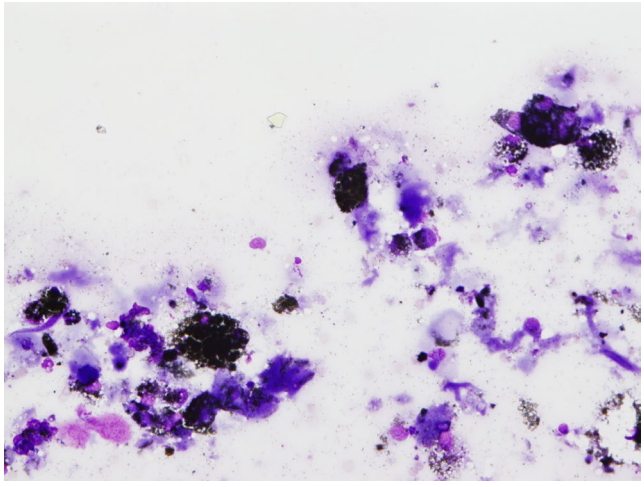

FIGURE 2 Representative photographs of the metatarsal lesion. May-Grünwald Giemsa stain, ×40 objective

Cytological Interpretation: Pigmented follicular tumor (trichoepithelioma, trichofolliculoma, tricholemmoma, pilomatricoma, infundibular keratinizing acanthoma), cyst of follicular origin, or melanocytic tumor (melanocytoma, malignant melanoma).

The slide was mildly to markedly cellular in some areas and moderately blood contaminated. Many anucleated squamous epithelial cells, keratin bars, keratinaceous debris, and scattered brown/black pigment (melanin) were present in a variably proteinaceous background. A small number of cholesterol clefts were also noted. Many melanin-containing cells were present, with some too granular to discern lineage. Where examinable, some appeared to be melanophages, which also showed erythrophagocytosis. Small numbers of plump, spindle-shaped cells with dark cytoplasmic granules (melanocytes) were also seen. Rare nucleated squamous epithelial cells were also scattered throughout.

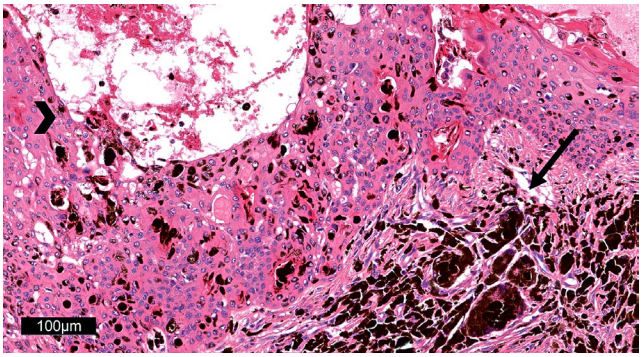

FIGURE 4 Photomicrograph showing trabecula of neoplastic epithelial cells surrounding a cystic area (arrowhead) infiltrated by low numbers of melanocytes and adjacent to a cluster of melanocytic cells (arrow). H&E stain, scale bar 100 µm

1.1 | ADDITIONAL TESTING

Excision and histopathology were performed (Figures 3 and 4). There was a focal, well-circumscribed, unencapsulated, expansile dermal mass composed of cords and trabeculae of neoplastic epithelial cells. These cells surrounded cystic areas containing eosinophilic material and amorphous and laminar keratin and were supported by moderate amounts of fibrovascular stroma. Neoplastic cells had indistinct cell borders, moderate amounts of eosinophilic cytoplasm, and round to oval nuclei with basophilic finely stippled chromatin, often with a prominent nucleolus. Anisocytosis and anisokaryosis were mild, and the mitotic activity was low (less than one in 10 high power fields). Surrounding and infiltrating within the trabeculae of neoplastic epithelial cells and the stroma were variable numbers of a second population of neoplastic polygonal cells. These cells had variably distinct cell borders, abundant cytoplasm, and frequently contained abundant brown pigment (melanocytes) and round to oval nuclei with finely stippled chromatin that occassionally had a prominent nucleolus. Anisocytosis was moderate, anisokaryosis was mild, and mitoses were rare. The first population of neoplastic cells was strongly positive for cytokeratin, whereas the second population demonstrated moderate positivity for Melan A. The histomorphologic diagnosis was melanoacanthoma.

Melanoacanthomas are considered benign tumors, and surgical excision is curative. In this case, surgical excision was achieved with small margins. On follow-up, the lesion had not returned after 18 months.

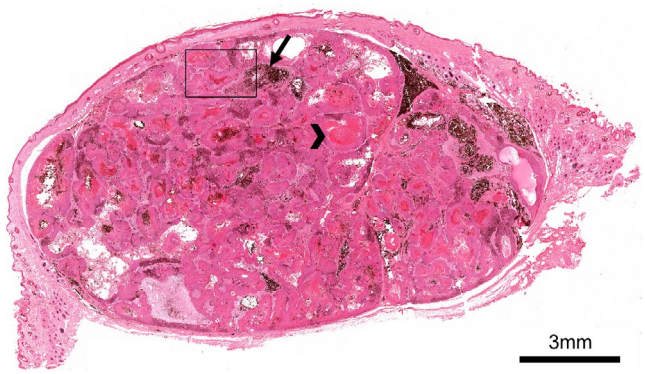

FIGURE 3 Photomicrograph of the dermal mass showing a focal, well-circumscribed, unencapsulated, expansile mass composed of cords and trabeculae of neoplastic epithelial cells (arrowhead) surrounding cystic areas containing eosinophilic material and amorphous and laminar keratin. Surrounding trabeculae form small solid areas and infiltrating cords of epithelial cells. The stroma has variable numbers of neoplastic melanocytes (arrows). The area of the higher power image in Figure 4 is indicated by the black rectangle. H&E stain, scale bar 3 mm

2 | DISCUSSION

Melanoacanthoma, or melanocytoma-acanthoma, is a rare neoplasm in the dog, with only four previously described cases in the literature.[1-4] However, gross and histologic lesion descriptions are available, and detailed descriptions of the clinical and histologic features have been published.[5] This phenomenon is included in the International Histologic Classification of Skin tumors of domestic animals,[6] and the tumors have features of both compound melanocytic tumors and benign epithelial neoplasia.

From the limited number of published descriptions, lesions are typically solitary well-circumscribed, pigmented dome-shaped masses ≤ 1cm[2,4,5] in diameter on gross examination. Some reports also describe alopecia[2,4] similar what we saw in this case. Given the infrequency of reports about these lesions, age, breed, and predilection sites have yet to be ascertained. However, in the four previously reported cases, three occurred on the head,[1-3] and one occurred on the dorsal trunk.[4] In the case of this report the tumor occurred in the distal metatarsal area. To the authors' knowledge, this lesion has not been reported in the cat.

Histologically, the tumors typically have cords and anastomosing trabeculae of neoplastic epithelial cells with cystic structures

containing amorphous and laminated keratin. The melanocytic component lines the peripheral layer of the trabeculae and cysts in nests and clusters. The lesion described in this report demonstrated these characteristics.

The cytology did not completely mirror the characteristics observed on histopathology. Anucleate and nucleated squamous epithelial cells and keratin debris were observed on cytology rather than polygonal epithelial cells. These might represent the laminar and amorphous keratin from cystic structures. Additionally, the melanocytes were spindle shaped on the cytologic sample yet polygonal on histopathology. Melanocytes are pleomorphic cells with round, stellate, and spindle shapes possible. The difference in shape could be attributed to the different sampling methods and different regions of the tumor.

Erythrophagocytosis was noted in melanophages, which is indicative of previous intralesional hemorrhage. Hemorrhage has not been described in previous reports or texts; thus, the authors speculate that the distal metatarsal location of the lesion could make it more prone to trauma.

There is no human counterpart; in people, the term melanoacanthoma describes a different lesion. Cutaneous melanoacanthoma in people is considered a variant of seborrheic keratosis, a benign lesion that is typically an epidermal plaque comprising predominantly epithelial cells with some infiltrating melanocytes. Common locations are the head and trunk.[7]

The presence of both the squamous and melanocytic components in the cytologic preparations led to an extensive differential list. Keratin debris and anucleated squamous epithelial cells are common in several follicular tumors such as trichoepithelioma, trichofolliculoma, tricholemmoma, pilomatricoma, and also cysts of follicular origin. Consequently, these tumors cannot be distinguished cytologically. Melanin pigment can also be present in these lesions; however, it is found in melanophages or melanized squamous epithelial cells and is not due to a neoplastic melanocytic component. In aspirates with cytologic features consistent with a follicular cyst or tumor and an accompanying melanocyte population, melanoacanthoma should be considered a possible differential.

To the authors' knowledge, this is the first cytologic description of a melanoacanthoma in the dog.

DISCLOSURE

The authors have indicated that they have no affiliations or financial involvement with any organization or entity with a financial interest in, or in financial competition with, the subject matter or materials discussed in this article.

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How to cite this article: Haining H, Hollyer J, Crawford D, Bell F, Gamino V, Millins C. What is your diagnosis? Fine-needle aspirate biopsy from a skin mass on the distal metatarsus of a dog. *Vet Clin Pathol*. 2021;50:462–464. https://doi.org/10.1111/vcp.12939