



ISSN: 2456-2912

VET 2024; 9(5): 576-577

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www.veterinarypaper.com

Received: 02-08-2024

Accepted: 04-09-2024

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Cytological diagnosis of malignant melanoma in a dog

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DOI: <https://doi.org/10.22271/veterinary.2024.v9.i5i.1769>

Abstract

A 9 years old male Rottweiler dog was presented to the Surgical unit of Madras Veterinary College Teaching Hospital with the history of mass located on its nail bed of the 4th digit of the forelimb. Fine needle aspiration procedure was performed from the mass and the smears were referred to the Centralised Clinical Laboratory, Madras Veterinary College, Chennai for cytological diagnosis. Cytological examination revealed population of pleomorphic cells which were round to elliptical in shape with centrally to eccentrically placed round to ovoid nuclei containing coarsely granular chromatin. The cytoplasm was abundant which were lightly bluish in colour containing numerous brownish to blackish melanin granules of variable sizes. In addition, numerous mitotic figures were also observed. Based on the cytological findings, the lump was diagnosed as malignant melanoma.

Keywords: Melanoma, malignant melanoma, dog, cytology

Introduction

Melanoma, a neoplasm arising due to uncontrolled proliferation of melanocytes has been reported not only in humans but also in wide range of other vertebrate species including fish, reptiles, birds and mammals. Among various species affected, it is relatively common in dogs and horses followed by sheep and goat while rare in cattle and cats. In pigs, melanoma is not common but recorded in dark skinned pigs like Duroc and its crossbreeds.

Melanocytic tumours are relatively common in dogs and are typically malignant accounting for 0.8–2% of all cutaneous tumours (Williams *et al.*, 2003) [9]. Dogs which are middle-aged or older with an average age of 9 years are more likely to develop malignant melanomas with no gender predilections (Miller *et al.*, 2013) [5]. Among breeds, the prevalence is higher in pure breeds, especially Standard and Miniature Schnauzers, Doberman Pinschers, Scottish Terriers, Irish and Gordon Setters, and Golden Retrievers.

Sunlight might be an etiological factor in the development of melanocytic tumours in areas of the body exposed to sun, especially the face and pinnae. In addition, other factors namely presence of pigmented cells, trauma, chemical agents, buccal microflora etc., might be responsible for the development of melanocytic tumours (Dzutse *et al.*, 2015) [3].

Canine malignant melanoma exhibit diversified biological behaviour which is primarily defined by anatomic site, size, stage, and histopathological characteristics. The most common location for canine melanoma is the oral cavity followed by skin, eye and digits (Subapriya *et al.*, 2018) [7]. Although not entirely, the anatomic location of melanoma can be used to predict the likelihood of local invasiveness and metastatic spread. On the other hand, oral or mucosal melanomas are frequently malignant and metastatic, with a reported median survival time (MST) of 14 months for stage I and three months for stage III disease (Williams *et al.*, 2003) [9]. Haired skin melanomas that do not involve mucosal margins typically behave in a benign manner (Bergman *et al.*, 2013) [2].

Materials and Methods

A 9 year's old male Rottweiler dog was presented to the Small Animal Surgery-Out Patient unit of Madras Veterinary College Teaching Hospital, Chennai, with a history of lump located

on its nail bed of the 4th digit of the forelimb. Fine needle aspiration cytology (FNAC) was performed and the FNAC smears were referred to the Centralised Clinical Laboratory, Madras Veterinary College, Chennai for cytological diagnosis. The FNAC smears were air dried, stained with Leishman and Giemsa cocktail stain as described by Garbyal *et al.* (2006) and subjected to microscopical examination.

Results and Discussion

Cytological studies showed population of neoplastic cells which were round to elliptical shaped with round to ovoid nuclei containing coarsely granular chromatin. The cytoplasm of most of the neoplastic cells was abundant and lightly bluish in color with numerous granules. These cytoplasmic granules which were brownish to blackish in color with variable sizes were suggestive of melanin granules (Fig.1). Our findings were in accordance with that of Podarala *et al.* (2012)^[6] and Sunil *et al.* (2024) who also observed round or fusiform cancerous cells, with dark black or brown colored pigmented cytoplasm containing centrally or eccentrically placed nuclei and characteristic brownish-black intracytoplasmic pigments in their study on cytological findings of malignant melanoma in dogs. In addition, mitotic figures were observed in few to many fields which confirmed the malignant nature of the tumour (Fig.2). Thus, based on the cytological findings, the mass was confirmed as malignant melanoma.

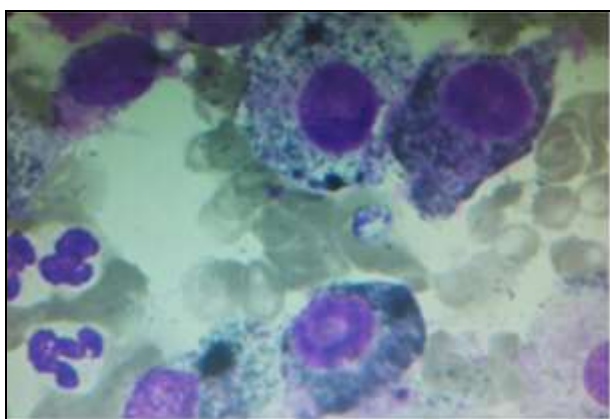


Fig 1: Canine- Melanoma- Cytology- LG stain – Pleomorphic cells with cytoplasmic melanin granules x 1000

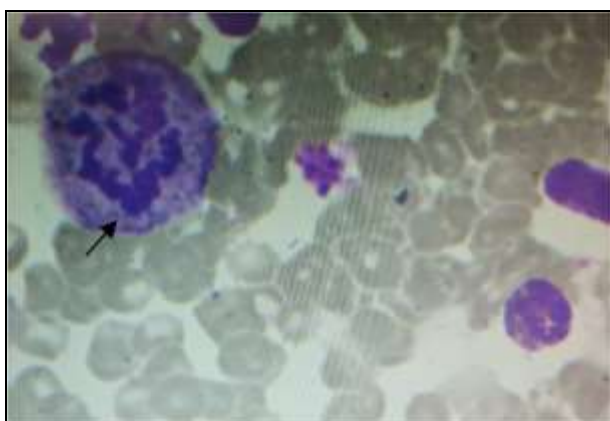


Fig 2: Canine- Melanoma- Cytology- LG stain – Mitotic figure x 1000

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How to Cite This Article

Ramesh S, Subapriya S, Kumar V, Shiju Simon M, Nithya P, Senthilkumar K. Cytological diagnosis of malignant melanoma in a dog. *International Journal of Veterinary Sciences and Animal Husbandry* 2024; 9(5): 576-577.

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