Metastatic malignant melanoma in dog – A case report

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ABSTRACT


A three year old male Labrador dog was presented with history of anorexia, dyspepsia, respiratory distress and weakness. On physical examination, the dog showed small round lumps on the skin. Ultrasonography examination of heart, lung, liver and kidney depicted multifocal abnormal tissue. Multifocal neoplastic growths in different organs were tentatively diagnosed and the dog was symptomatically treated until death. On postmortem examination, multiple dark black masses varying from 0.5 to 3 cm in diameter were detected in heart, lung, liver, kidney, bladder and intestine. Histopathologically, these masses were diagnosed as malignant melanoma and variable melanin pigments within the neoplastic cells were confirmed by Fontana-silver method of staining technique. These tumors were considered to have originated from the primary site of skin or intestine.

Key words: Dog, Fontana-silver staining, malignant melanoma, pathology

Malignant melanoma is a malignant tumour of melanocytes and generally seen in older animals1-3. The tumour is also simply referred to as melanoma, whereas melanocytoma refers to the benign form3. Primary malignant melanoma appears most often in the skin and less frequently in the choroid layer of the eyes, under the hair, in the leptomeninges, oral cavity, nasal mucosa, pharynx, oesophagus, bronchus, vaginal or anorectal mucosa and is the most important malignant tumour having the potential to metastasize to the gastrointestinal tract in humans4. The tumour is common in dogs5, and are frequently seen on the skin of the head, limbs, mucous membranes and mucocutaneous junctions such as in the oral cavity6. It is often locally invasive and metastases frequently occurs to regional lymph nodes and lungs. However, metastasis of malignant melanomas to other body sites such as brain, heart, spleen and liver is uncommon1. This report presents a case of malignant melanoma in a three year old male Labrador dog in which almost all visceral organs and skin revealed tumours.

A three year old male Labrador dog was presented with history of anorexia, dyspepsia, respiratory distress and weakness to the Veterinary College hospital, Namakkal, India. After physical examination, the dog was subjected to ultrasonographic examination. Fine needle aspiration cytology (FNAC) was taken from the skin lumps and examined after staining the smear with Leishman-Giemsa combined stain. After death, tissue samples were fixed in 10% neutral buffered formalin, processed routinely, sectioned at 5 μm, and stained with hematoxylin and eosin (H&E). Selected sections were subjected to Masson-Fontana-silver method of staining technique.

On physical examination, the dog showed small round lumps on the skin (Fig. 1). These lesions ranged in size from 0.5 to 3 cm in diameter. FNAC smear revealed pleomorphic cells with anisokaryosis and poikilocaryosis. Dark brown intracytoplasmic pigment suggestive of melanin was also detected. Ultrasonographic examination of heart, lung, liver and kidney depicted multifocal abnormal tissue. Multifocal neoplastic growths in different organs were tentatively diagnosed and the dog was symptomatically treated until death. On postmortem examination, multiple dark black masses varying from 0.5 to 3 cm in diameter were detected in almost all visceral organs like heart, lung, liver, kidney, bladder and intestine (Fig. 2 to 7).

Microscopically, melanin laden pleomorphic melanocytes were observed proliferating in the form of solid sheets, cellular clusters or nests and parallel cords in all vital visceral organs such as heart, lung, liver and kidneys (Fig. 8 to 11). Tumour cells were ovoid in shape and varied in size. Hyperchromatic nuclei in different shape and size with multiple prominent nucleoli were noticed. Intracytoplasmic dark brown to black melanin pigment was observed in the tumour cells under H&E staining, which was confirmed by Fontana-silver staining technique in which the melanin was seen as dark stained blackish pigment in the cytoplasm (Fig. 12). Few multinucleated giant cells were also observed and the mitotic index calculated was 37 mitoses/ ten high power fields (40x).

Multiple melanocytic tumours were observed in almost all organs of the dog under investigation.

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Fig. 1. Melanoma growths on the skin; Fig. 2. Heart revealing multiple foci of melanomas in the myocardium; Fig. 3. Lung exhibiting multiple variable sized melanomas; Fig. 4. Liver parenchyma showing discrete foci of melanomas; Fig. 5. Kidney parenchyma evincing variable sized melanomas; Fig. 6. Urinary bladder showing melanoma nodules; Fig. 7. Intestinal wall depicting a melanoma growth; Fig. 8. Heart showing pleomorphic neoplastic melanin laden melanocytes arranged in sheets, clusters or nests. H&E x400; Fig. 9. Lung showing pleomorphic neoplastic melanin laden melanocytes arranged in sheets or cords. H&E x400; Fig. 10. Liver section depicting melanin laden melanocytes with mitotic figures. H&E x1000; Fig. 11. Kidney section showing tubular necrosis and pleomorphic neoplastic melanin laden melanocytes arranged in sheets. H&E x400; Fig. 12. Liver section exhibiting black melanin pigment laden neoplastic melanocytes. Masson-Fontana Silver stain x400.
Melanomas originate from epidermal melanocytes or melanoblasts which are of neuroectodermal origin\textsuperscript{3,7,8}. Secondary tumours are formed through metastasis hematogenously or via lymphatics to regional lymph nodes, liver, small intestines, heart, brain, spleen and lungs\textsuperscript{9}. In the present case, because of the multiple localization of well-defined tumour lesions in the multiple organs, it is considered that these lesions were metastases of malignant melanoma.

Commonly reported site for primary melanoma is skin. Intestine is also considered as primary site for the spread of secondary tumours to other organs\textsuperscript{10,11}. It has been proposed that differentiated ectodermic cells may approach the distal ileum and colon via the omphalomesenteric duct, thus serving as the precursor of primary intestinal melanomas\textsuperscript{12}. In the current case, metastases might have occurred from either skin or intestine, since melanoma was detected in both locations.

The causes of melanomas are uncertain. In humans, risk factors such as race, lack of skin pigmentation, excessive exposure to sunlight, and the presence of pre-existing nevi have been described\textsuperscript{13}. In horses, the loss of melanin pigment with age and animals with grey or white hair coats have been identified as risk factors\textsuperscript{13}. But, some reports also suggest that dark-skinned animals are more often affected\textsuperscript{14}. This case of multiple malignant melanoma occurred in a black-skinned dog.

Histopathological characteristics, including pleomorphism, cytoplasmic pigmentation, giant cells and high mitotic figures were indicative of malignant melanoma\textsuperscript{1}. The tumour cells were demonstrated to be positive for melanin pigment by Fontana-silver staining method, which is specific to confirm melanoma.

**REFERENCES**