The Haryana Veterinarian (March, 2024) **63(SI),** 131-132 ISSN 0033-4359 (P)

Clinical Article

CUTANEOUS MAST CELL TUMOUR IN DOG: A CYTOLOGICAL AND HISTOPATHOLOGICAL STUDY

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Received: 27.08.2023, Accepted: 12.11.2023

SUMMARY

Mast cell tumours (MCTs) are uncommon to rare in other species but quite prevalent in dogs and cats. The majority of MCTs in animals manifest as single skin nodules; however, solitary MCTs in humans are uncommon. Cutaneous neoplasm is a second most common tumor detected in dog. Mast cell tumour (MCT) accounts for 16% to 21% of all canine cutaneous neoplasms and is the second most common malignancy detected in dogs. However, canine MCT has a very varied propensity for recurrence and metastasis as well as a highly uneven clinical presentation and biological function. A 7 years old dog with the large tumorous mass on left hind limb. The excisional biopsy along with the cytological examination carried out. A cytologic seven-year-old with toluidine blue stain revealed the metachromatic granules in cells. Histopathological examination revealed round to oval uniform sized cells with eosinophilic cytoplasm arranged in rows looking like stacks of coins.

Keywords: Canine, mast cell tumour, cytology, histopathology

How to cite: Desai, J.K., Mathur, M., Dadhich, H., Mehra, M. and Asopa, S. (2024). Cutaneous mast cell tumour in dog: A cytological and histopathological study. *The Haryana Veterinarian* **63(SI)**: 131-132.

Mast cell tumours (MCTs) are uncommon to rare in other species but quite prevalent in dogs and cats. The majority of MCTs in animals manifest as single skin nodules; however, solitary MCTs in humans are uncommon. Given that they exhibit different biological behaviours, subcutaneous MCTs and cutaneous MCTs in dogs should be separated from one another. Intestinal MCTs, MCTs in visceral organs, and uncommon MCTs in other places such the mouth cavity or craniomediastinum are less frequent sites of MCTs in mammals (Sledge *et. al.*, 2016). It is not often clear whether MCTs in visceral organs are primary sites of origin or metastases from known or undiagnosed cutaneous MCTs. Disseminated mastocytosis has been used to explain the synchronous emergence of MCTs in the liver, spleen and other organs, notably in cats. This condition is most likely indicative of a multicentric neoplastic disease process (Kiupel and Camus 2019). Mast cell leukaemia is rare in most animals, although when buffy coat preparations are examined, 40% of cats with MCTs also have mastocytemia. MCTs mostly afflict adult animals, although intriguing and rare mast cell proliferative diseases termed as mastocytosis, which may spontaneously regress, may affect puppies, calves, and foals. These odd creatures mirror the human illness known as urticaria pigmentosa. (Patnaik *et. al.*, 1984).

Fortunately, utilising fine-needle aspirates or histological sections stained with H&E, the vast majority of cutaneous MCTs may be easily detected. Even while the majority of cutaneous MCTs in dogs, cats, and horses are often treated by complete surgical excision, a small percentage of canine MCTs and a few isolated cases in cats and horses may migrate to the local lymph nodes or generate widespread metastases. Finding the histologic and molecular characteristics of MCTs that displayed more aggressive behaviour in dogs and to a lesser degree, in cats, has required a lot of investigation. The behaviour of cutaneous MCTs in other animals is less well studied due to their rarity. (Strefezzi *et al.*, 2003).

Mast cell tumour (MCT) accounts for 16% to 21% of all canine cutaneous neoplasms and is the second most common malignancy detected in dogs. However, canine MCT has a very varied propensity for recurrence and metastasis as well as a highly uneven clinical presentation and biological function (Horta *et al.*, 2018). Finding prognostic indicators that predict outcome is thus necessary. The following clinical characteristics are now used as prognostic indicators: clinical stage, breed, anatomic location, and history of tumour recurrence (i.e., the dog first appeared with a secondary tumour rather than a primary tumour). Despite all of these prognostic indicators, the small animal practitioner still finds it difficult to make decisions. Since this would be helpful for therapeutic choices as well as patient selection in clinical trials, it would be useful to categorise dogs with MCT as having a low, moderate, or high risk for tumour recurrence or metastasis (Patnaik *et al.*, 1984).

By using fine needle aspiration cytology (FNAC), samples for cytological examination were taken from each tumour prior to surgery. By employing an aspiration method with a 20-22 gauge needle and a 5-10 ml syringe, FNAC samples were obtained. A clean glass slide was used right away to transfer the sample. Toluidine staining

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techniques were used to colour fixed smears for examination under a light microscope (Valenciano and Cowell, 2014). Below are the staining and sample collecting details. A seven-year-old stray dog arrived to the T.V.C.C., CVAS, Bikaner with a 28-day history of a pendulous, big lump on the back of the left leg. The huge lump was surgically removed and transferred to the pathology department for histopathology. Haematoxylin-eosin was used to stain 5-mm thick slices of the tumour tissue that had been fixed in formalin for 72 hours. Under light microscopy, a histopahological study was carried out (Luna, 1968).

A mast cell tumor's cytological analysis indicated round cells with a moderate to high level of cellularity. The cubicles were set up either alone or in groups. Anisocytosis and anisokaryosis of a mild degree were seen in the smear. The nuclei were uniformly sized, spherical and positioned in the centre. Few fibroblasts and a lot of inflammatory cells were also observed in the smear (Fig. 2). Granules were seen in the cytoplasm of the cells with a stable N:C ratio. Granules of mast cell fragments covered the background. Mast cell tumour was confirmed by the toluidine blue stained smear, which showed mast cells with purple metachromatic granules organised in clusters or sheets (Duncan and Prasse,1979). Mast cell tumours were histopathologically found to be loosely distributed in sheets of well-differentiated neoplastic cells, with the gaps between them being collagen bundles or empty spaces. The rows of uniformly sized round to oval cells are organised in a way that they resemble stacks of coins (Figs. 3 & 4). Cells with eosinophilic cytoplasm and round to oval nuclei of uniform size. Toluidine blue staining might show that the cells' cytoplasm had many of purple-coloured metachromatic granules. Eosinophil infiltration, a defining hallmark of canine mast cell tumours, was also seen in the area. Erythrocytes filled the blood vessels in the connective tissue stroma (Patnaik *et al.*, 1982).

CONCLUSION

Micromorphological and cytological examination confirm the cutaneous mass of cell as mast cell tumour.

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RETRACTION OF ARTICLE

This article earlier available at https://www.luvas.edu.in/haryana-veterinarian/download/harvet2016-dec/1.pdf entitled *"Occurrence of some organochlorine pesticide residues in poultry feed and meat"* has been retracted by the authors because of some error made during the data analysis process of the experimental observations due to counting the number of samples showing the concentration of pesticide below its corresponding Limit of Detection. All authors take full responsibility for this mistake and sincerely apologize for any inconvenience it may cause.

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