



AN UNUSUAL CASE OF MAMMARY MASTOCYTOMA IN A FEMALE LABRADOR

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Mast cell tumours are usually subcutaneous masses found in adult dogs with specific breed predisposition. These are either benign or malignant and may metastasize later in their course but their true metastatic potential is not entirely known (Webster *et al.*, 2007; Welle *et al.*, 2008). The prognosis of canine mast cell tumours depends upon the degree of involvement and stage of neoplasia. However, the involvement of canine mammary tumour by mast cell neoplasia seems to be unusual and not reported so far. The present case report deals with a unique case of mammary mastocytoma.

A 7-year female labrador was brought to the Small Animal Veterinary Clinic, GADVASU, Ludhiana (India) with the history of mammary swelling. Clinical examination was done and gross findings were recorded. A blood sample was also collected for haematology. Cancer markers viz., surface glycoproteins [cancer antigen 15-3 (CA 15-3)] and carcino-embryonic antigen (CEA; RayBiotech, USA) and inflammatory cytokines [Interleukin-8 (IL8)] and tumour necrosis factor α (TNF α) [Bioassay Technology Laboratory, China] in the serum of affected dog were analyzed by ELISA using commercially available kits. General anesthesia was given prior to surgery and tumorous mass was excised by simple mastectomy (Misdorp, 2002). Tissue samples 0.5 cm thick from multiple sites of tumour were preserved in neutral buffered formalin and processed for routine histopathology. The sections were stained with haematoxylin and eosin (HE), toluidine blue and Masson's trichrome (Bancroft and Gamble, 2008). Grading was done as per Kiupel *et al.* (2011) depending on how well the mast cells were differentiated, mitotic activity, location within the skin, invasiveness, and the presence of inflammation or necrosis.

Clinical examination revealed no history of fever, vomiting and diarrhoea. Hemogram revealed absolute eosinophilia and haemoconcentration (haemoglobin 17.1 g dL⁻¹, packed cell volume 52.8%, total leucocyte count 17050 cu mm, neutrophils 60%, lymphocytes 20%, eosinophils 20%). On palpation, the tumour was hard, without any ulceration, measured 5-10 cm involving right inguinal teat surrounded by erythematous zone. The serum ELISA for cancer markers revealed mild to moderate elevation in CEA, IL8 and TNF α but no increase in mammary cancer specific marker CA15-3 (Table 1). The cytokines might have played a role in causation of tumour and were possibly elevated due to inflammation associated with it was also noticed by histopathology.

Histopathology revealed a round cell tumour, with large round cells scattered below epidermis randomly (Fig. 1), having abundant basophilic cytoplasm and moderate nuclear pleomorphism. The infiltrating tumour cells were also seen in dermis distorting and tearing apart the

Table 1: Serum markers in mammary mastocytoma and tumour free animals

Parameter	Mastocytoma case	Tumour free animals (mean $\pm$ SE) (n = 6)
Tumour necrosis factor α (pg mL ⁻¹)	31.33	22.01 $\pm$ 2.36
Interleukin-8 (pg mL ⁻¹)	36.00	29.85 $\pm$ 2.98
Cancer antigen 15-3 (U mL ⁻¹)	1.26	1.25 $\pm$ 0.04
Carcino-embryonic antigen (ng mL ⁻¹)	2.31	1.02 $\pm$ 0.17

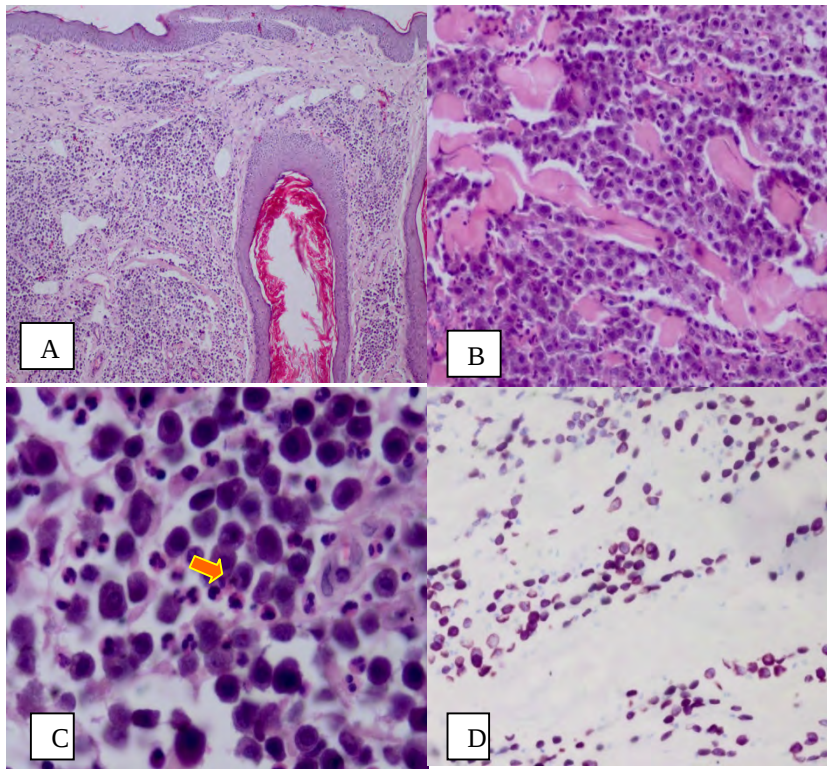


Fig. 1: A) Mast cell tumour showing large number of mast cells scattered randomly below the epidermis and into dermis (H.E $\times$ 100x); B) Tumour cells infiltrating in the dermal musculature arranged in cords (H.E $\times$ 400x); C) Several eosinophils (arrow) intermingled with tumour cells (H.E $\times$ 1000x); D) Tumourous mast cells showing variable number of typical purple granules filling the cytoplasm and also showing nuclear pleomorphism (Toluidine blue $\times$ 400x)

skeletal muscle fibers and arranged mostly in cords and bundles (Fig. 1B). A significant number of eosinophils intermingled with tumour cells were also found (Fig. 1C) particularly in perivascular location. Ozaki *et al.* (2002) observed slight to heavy number of eosinophils in dogs suffering from mast cell tumour. Once activated, mast cells release inflammatory mediators within injured tissue by degranulation (Noli and Miolo, 2001) and eosinophils generally come to counteract the inflammatory mediators released by mast cells. Focal neutrophil infiltration was also noted indicating secondary suppurative inflammation. Only occasional atrophied mammary acini were visible in the inner layers of tumour having no features of neoplasia indicating no primary mammary involvement. Based on these features at HE, toluidine blue and Masson's trichome staining were employed to differentiate between histiocytic and mast cell tumours. On toluidine blue staining, the tumour cells showed typical purple granules filling the cytoplasm of mast cells in variable proportion (Fig. 1D), confirming the diagnosis of mast cell tumour as observed by Alketa *et al.* (2014). Thus tumour was graded as of grade II. This case of mammary mastocytoma seems to be the first report of such a tumour in India. The case was initially suspected as mammary tumour but on histopathology it did not show any mammary epithelial involvement. Perusal of literature did not reveal any such case report from India. Such tumours have been categorized in a separate group designated as "others" according to the latest classification of canine mammary tumours (Goldschmidt *et al.*, 2011).

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