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Cutaneous mast cell tumour in a dog

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Abstract
A 9-year-old male Dachshund dog was presented to the local multi-speciality hospital, Chennai with the history of presence of multiple masses on the scrotal area for the past 6 months for surgical removal. Blood samples, peripheral blood smears and fine needle aspiration smears of the mass were collected and sent to the Centralised Clinical Laboratory, Madras Veterinary College, Chennai for laboratory diagnosis. Haematological values were found to be within normal limits except leukocytosis with neutrophilia of left shift. Serum biochemical studies also showed no abnormal changes in parameters pertaining to liver functions and kidney functions. Cytological examination revealed predominant population of discrete round to oval cells having small to moderate amounts of pale basophilic cytoplasm with varying numbers of characteristic purple colored (metachromatic) granules. Based on the present laboratory findings, the lump was confirmed as mast cell tumour.

Keywords: Mast cell tumour, Dog, cytological diagnosis

Introduction
Mast cell tumours (MCTs), otherwise called as mastocytoma, the most common skin tumours of dogs are highly invasive and metastatic comprising 16 to 21% of all cutaneous tumors encountered [1]. The biologic behaviours of MCTs are highly variable, ranging from solitary benign to highly malignant multiple masses which are potentially fatal. However, their true metastatic potential is not entirely known [2]. It is mostly found on the hind limbs, abdomen, perineum, and scrotum. MCTs of the preputial, inguinal, and sub inguinal regions and other mucocutaneous sites tend to be more aggressive. When these tumours are aspirated, they tend to exfoliate well, making the samples often more cellular [3].
Among different breeds affected, Boxers, Boston terriers, Beagles, and Labrador retrievers are more prone to MCTs. Some studies have shown that genetics play a role in breed predilections in which mutations in the c-kit tyrosine kinase receptor result in malignant transformation of mast cells. Although, middle-aged to older dogs are commonly affected, younger dogs as young as 3 weeks old are also sometimes affected, However, no gender predilection has been reported [4, 5].

Materials and Methods
A 9 years old male Dachshund dog was presented to the local multi-speciality hospital, Chennai with the history of presence of multiple masses on the scrotal area for the past 6 months for surgical removal. Blood sample containing EDTA as an anticoagulant, clotted blood sample, peripheral blood smears were collected and sent to the Centralised Clinical Laboratory, Madras Veterinary College, Chennai for hematobiochemical studies. In addition, fine needle aspiration procedure was performed on the mass and the aspiration smears prepared were also referred for cytological diagnosis. Haematological and biochemical estimations were carried out using auto analyser namely Mindray BC - 2800 and A15 Biosystems. The FNAC smears as well as blood smears were air dried, stained with Leishman and Giemsa cocktail stain [6] and subjected to microscopical examination.

Results and Discussion
Haematobiochemical values recorded in the present study are shown in Table 1.

Haematological parameters were found to be within normal limits except leukocytosis with left shift neutrophilia. Serum biochemistry also revealed no changes in parameters related to liver and kidney functions. Cytological examination revealed predominant population of discrete round to oval cells having moderate amounts of cytoplasm which were pale basophilic. The cytoplasm was filled with varying numbers of characteristic fine to coarse purple coloured (metachromatic) granules with eccentrically placed nucleus (Fig.1). Only a mild anisocytosis and anisokaryosis were observed. In many areas extracellular granules released from mast cells were also noticed along with few non-degenerate neutrophils and eosinophils. Based on the cytological evaluation, the mass was confirmed as mast cell tumour (MCT).

Table 1: Dog-MCT- haematobiochemical parameters

S. No.	Parameters	Values	Reference range
1.	Haemoglobin (g/dl)	12.00	11.9-18.9
2.	PCV (%)	45	37-55
3.	RBC (millions/cumm)	5.8	6-9
4.	WBC (x 10^3 /cumm)	21,000	6000-11,000
5.	Platelets (x 10^5/cumm)	2.8	2-9
6.	Differential count	Neutrophils -82% Lymphocytes-14% Eosinophils - 4%	Neutrophils: 60-75% Lymphocytes: 12-30% Monocytes: 3-9% Eosinophils: 0-4% Basophils: Rare
7.	BUN (mg %)	14	10-28
8.	Creatinine (mg %)	0.82	0.5 to 1.5
9.	SGPT (ALT) (IU/L)	32	21-102
11.	ALP (U/L)	112	20-156
12.	Total protein (g %)	5.8	6.8-7.8
13.	Albumin (g %)	3.0	3.1-4.0

*Coles, 1986

Fig 1: Dog-- Mast cell tumour- multiple masses covering the scrotum

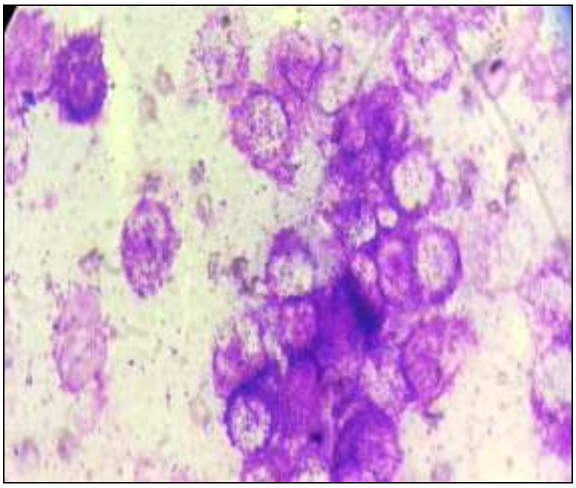

Fig 2: Cytology of mast cell tumour showing round cells with numerous metachromatic cytoplasmic granules and pale round nucleus. Leishman Giemsa x 1000

The present haematological findings were in accordance with earlier report [7] in which leukocytosis and neutrophilia in addition to mild anaemic changes in 8 year old male Pomeranian dog affected with MCT. In contrast, severe anemia was noticed in a 13 years old dog affected with mastocytoma [5]. The biochemical findings recorded in the present study were also in accordance with the earlier findings [7] who also observed no abnormalities in serum biochemical values pertaining to liver and kidney functions.

The cytological observations made in the present study correlates well with previous reports [7] who also recorded numerous discrete neoplastic cells containing purple granules in the cytoplasm, pushing the nucleus to the periphery with round to spherical nuclei in aspiration smears collected from multiple cutaneous masses located on the lower abdomen of an 8 years old male Pomeranian dog affected with mastocytoma. In addition, they also recorded extracellular granules as reported in the present study. Similar cytological observations were also reported in a 13 years old, male, half-breed dog with a mass at the eyelid of the left eye which was confirmed as MCT [5].

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