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A case of cutaneous mast cell tumour in a male French bulldog

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Abstract

A six-year-old male French bulldog was presented with the history of a localized nodule over the left lateral abdomen in Multi-Speciality Small Animal Clinics of Department of Teaching Veterinary Clinical Complex, GADVASU, Ludhiana. The dog showed no other clinical abnormality. Hemato-biochemical parameters were also found to be in normal range. Radiography of thorax and abdomen showed no evidence of metastasis. Fine needle aspiration cytology revealed presence of round cells showing features of mast cell tumor. Histopathological findings were suggestive of mast cell tumor, which was confirmed by using toluidine blue staining. The dog was treated with prednisolone @ 2mg/kg po bid after surgical excision of mass and further tapered accordingly. No remission of clinical signs was observed afterwards.

Keywords: Dog, mast cell tumor, prednisolone, surgical excision

Introduction

Mast cell tumours are hematopoietic tumours, comprised of mast cells and most commonly encountered tumors in canine practice. These tumors are the most frequently diagnosed neoplasms out of all cutaneous cancers which accounts for 16-21 percent (Withrow *et al.*, 2012) [16], thus plays a vital role in Veterinary Oncology. Primarily MCT seen in older dogs (8-10 years), but can be present in young dogs. No sex predisposition has been found to be correlated with mast cell tumours. Some predisposed breeds include dogs of Bulldog descent (including Boxers and Pugs), Golden Retrievers and Weimaraners (Garrett *et al.*, 2014) [2]. The grading of MCT varies according to several features. Clinical presentation of MCT varies according to grading and malignancy. Metastases mostly affect localised lymph nodes, although they can also eventually affect the spleen, liver and other organs. It is frequently noticed in skin and less commonly in the intestine (Meuten *et al.*, 2008) [7].

Canine MCTs have variable biologic behaviours, ranging from solitary benign masses that can be cured with surgery alone to systemic and potentially fatal metastatic disease (Welle *et al.*, 2008) [15] and are always considered potentially malignant, but their true metastatic potential is not entirely known (Webster *et al.*, 2007) [14].

The therapeutic approach to be followed for MCTs depend on its grading as well as malignancy to different organs. Vinblastine and prednisolone are frequently utilised in first-line therapy and lomustine is frequently used in second-line therapy (Horta *et al.*, 2017) [4]. Prednisone or prednisolone-associated simplified procedures with a single chemotherapeutic drug have gained popularity (Teng, 2012 and Linde, 2021) [10,5].

Case history

A six-year-old French bulldog presented to Multi Speciality Small Animal Clinics of Department of Teaching Veterinary Clinical Complex, GADVASU, Ludhiana with the primary complaint of a nodular growth on left lateral abdomen (Figure 1). The dog was showing no other clinical abnormality. On physical examination, all the vital parameters were found to be normal. Blood and serum samples were sent for finding out any systemic involvement. For further investigation, fine needle aspiration cytology of the nodular growth and lymph nodes were taken for cytological examination. The cytosmear were stained with Leishman stain. Radiography and ultrasonography of thorax and abdominal region was done to rule out any metastasis to other organs. The Surgical excision was done and it was followed by oral therapy of prednisone @ 2mg/kg po bid for one week and then tapered accordingly. Excised mass then collected and fixed in 10% neutral buffer formalin for routine

histopathological examination as per the protocol given by Luna and Lee (1968) [6].



Fig 1: Nodular growth over left lateral abdomen

Results and Discussion

Hemato-biochemical parameters came out to be insignificant. Radiographic as well as ultrasonographic examination did not show any signs of metastasis to other organs. Lymph node aspiration cytological examination showed normal cellular population. All these parameters were similar with the findings of Van Pelt *et al.* (1986) [13]. However, cytosmear of nodular mass revealed presence of cells having red intracytoplasmic granules and the nucleus appeared pale or even totally unstained in some of the cells showing features of mast cell tumour (Figure 2). Similar cytological features were reported earlier (Valenciano and Cowell, 2020 and De Nardi *et al.*, 2022) [12, 1].

On histopathology, neoplastic cells were arranged in rows along with presence of eosinophils. Mast cells showed round to oval nucleus with cytoplasmic metachromatic granules (Figure 3). Toluidine blue staining of nodular mass revealed no nuclear staining along with presence of numerous metachromatic granules within their cytoplasm, which giving photonegative appearance to cell (Figure 4). All these histopathological findings were suggestive of mast cell tumours.

In present case, oral therapy of prednisone was given @ 2mg/kg po bid for one week after surgical removal of mass and animal was recovered after 2 weeks. After then, no clinical evidence of remission was noticed. Earlier report suggested that, treatment with prednisone at a rate of 2.0 mg/kg per day and vinblastine at a dose of 2.0 mg/m² once a week was effective for dogs with high grade as well as low grade MCT after surgery (Gaspar, 2017 and Thamm, 1999) [3, 11]. Lomustine is also used as a second treatment in terms of adjuvant chemotherapy @ 60-90 mg per m² every 21 days when the drug is used alone (Rassnick, 1999) [9]. The findings in cytology and histopathology confirm the diagnosis of a cutaneous MCT in the male French bulldog dog.

To conclude, low to moderate grade MCT can be treated with use of prednisone to decrease MCT volume in order to facilitate tumour excision. Diagnosis of MCT by cytology is rapid and reliable as it is a non-invasive procedure and causing less distortion of cell. However, histopathology is more challenging to differentiate MCT from other round cell

tumour. Although, toluidine blue staining helps in confirmation of MCT from cytological slides and tissue sections.

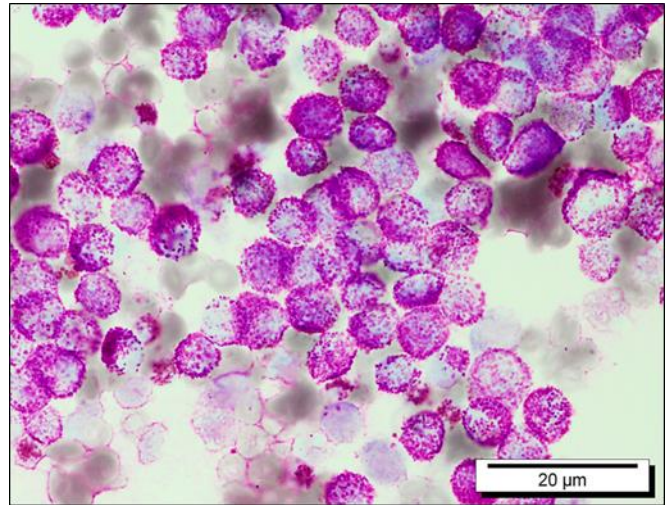


Fig 2: Cytosmear showing a high degree of cytoplasmic granulation and nuclei are obscured by the granulation. (Leishman; 100x)

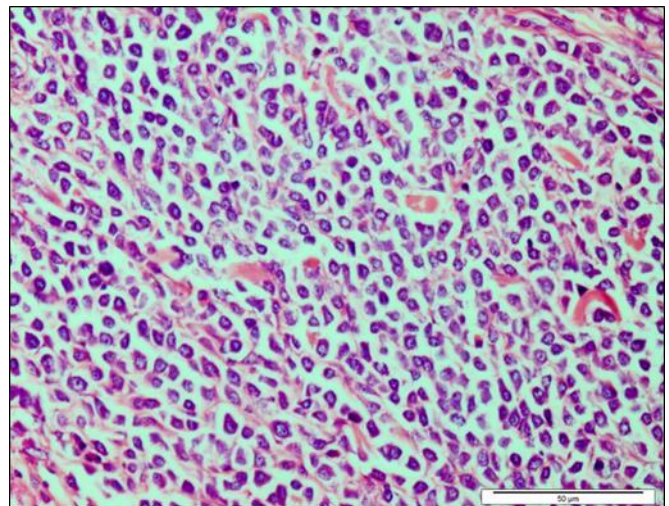


Fig 3: Neoplastic mast cells with evident of dark cytoplasmic granulation and round pale nuclei (H&E stain; 40x)

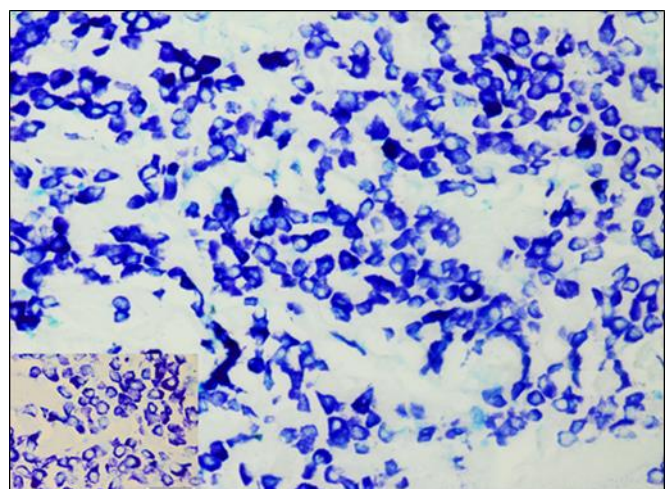


Fig 4: Neoplastic cells showing no nuclear staining and strongly stained to cytoplasmic granules giving photonegative appearance to cell (Toluidine blue; 100x)

Conflict of interest

The Authors declare that there is no conflict of interest.

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