

Mast Cell Tumour in a Dog and Its Surgical Management

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Abstract

An 8-year-old male Labrador dog was presented with a history of inappetence, occasional bloody diarrhoea and two ulcerated pea-nut sized swelling in the groin region. On the basis of complete blood cell count and cytological examination of the tumour aspirate it was diagnosed as a case of mast cell tumour. Under general anaesthesia the tumour nodules were excised and three doses of vincristine sulphate were given at recommended dose with dextrose normal saline. Post-operatively antibiotics, analgesics and supportive therapy were followed and the dog recovered well without any recurrence.

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Introduction

Mast cell tumours (MCTs) are highly invasive, metastatic and the most frequent round cell tumours in dogs, comprising 16-21% of all the cutaneous tumours diagnosed (Misdorp, 2004; Brodey, 1970). They are the most common skin tumours in dogs (Thamm and Vail, 2007), representing about 7% to 21% of all dog skin tumours and 11% to 27% of malignant skin tumours in this species (Newman *et al.*, 2007). The cause of the tumour is still unknown but a viral etiology is speculated. MCTs are found in the skin, spleen, liver, bone marrow or in any part of the body (Vasanth and Nagaraja, 2011). Increased risk for MCT development was found in spayed females of Boxers, Labrador retrievers, Pugs, Golden retrievers, Mastiff and Terrier respectively (White *et al.*, 2011).

Case History and Diagnosis

An 8-year-old male Labrador dog was presented with a history of two peanut sized swelling in the groin region (Fig 1). Besides it had inappetence, occasional hematochezia and hematemesis. Close examination revealed generalised cutaneous erythema and additional small nodular masses in other parts of body. The two large nodules showed oozing and ulceration. A complete blood count showed leukocytosis, neutrophilia with mild regenerative left shift and a normal erythrogram. Fine needle aspiration cytology (FNAC) confirmed it to be a mast cell tumour. Thoracic and abdominal radiography did not demonstrate any evidence of metastasis. Hence it was

decided to completely excise all the individual tumour masses.



Fig 1: Showing peanut sized tumour masses over groin region

Surgical Treatment

On the next day general anaesthesia was induced with atropine sulphate at the rate of 0.04mg/kg body weight, xylazine at the rate of 1 mg/kg and ketamine at the rate of 5 mg/kg intramuscularly after 12 hours of fasting. General anaesthesia was maintained with ketamine hydrochloride intravenously through 5% dextrose normal saline. The groin around the masses was shaved, scrubbed and prepared for surgery. A circular skin incision was made around the tumour mass. Soft tissues were carefully undermined; the mass was excised along with some healthy soft tissue and without any injury to it. Bleeding was meticulously

controlled with haemostatic forceps and ligation. Subcutaneous tissues were sutured using chromic cat gut no-1 for obliteration of dead space. Then the skin wound was closed by simple interrupted sutures using nylon. On the same way other nodular tumour mass was excised and sutured. Excised masses were sent for histopathological study. Post-operatively the dog was treated with inj. Ceftriaxone (Intacef) at 10 mg/kg body weight intramuscularly for 7 days and inj Meloxicam (Melonex) at 0.2 mg/kg bodyweight for 3 days intramuscularly. Three doses of Vincristine sulphate at 0.025 mg/kg was given intravenously at 15 days interval with dextrose normal saline. During the period of chemotherapy the patient was orally supplemented with liver extracts and multivitamins.

Result and Discussion

Mast cells are normal cells in the body that synthesize and release inflammatory mediators and participate in healing of body tissues. But mast cell tumours develop when one of these cells multiplies and grows abnormally. A MCT, apart from its metastatic potential, effects systemic damage by secreting chemicals like histamine, heparin, serotonin, prostaglandins and proteolytic enzymes. Excessive production of these chemicals leads to allergic symptoms, internal bleeding and gastric ulcers (Hottendorf and Nielsen, 1958). Along with the cutaneous swellings patients may also show loss of appetite, vomiting, diarrhoea, abdominal pain and dark faeces. Abdominal ultrasound or radiographs may be necessary to determine the likelihood of metastasis of malignant mast cells (Nielsen and Cole, 1958). In the present case some of these clinical signs were observed, but there was no metastasis. Complete surgical removal of tumour mass and follow up with chemotherapy turned out to be the most effective treatment (Bostock, 1973). The present case was managed on the same principles successfully. Chemotherapy after surgery was advised here to cure other smaller nodular masses and to prevent recurrence. The patient recovered uneventfully; its appetite improved and the gastrointestinal symptoms disappeared. The small nodules showed a gradual but

complete regression. The patient was followed up for one year and there were no signs of recurrence.

MCTs are diagnosed by aspiration and cytology. Complete blood cell count may reveal elevated mast cell count and low/elevated TLC. The average age of occurrence is 8 to 10 years in dogs (Bostock, 1973). The diagnosis of MCT by cytology or histopathology is straight forward in the majority of cases, but determining an accurate prognosis for therapy is more challenging (Welle *et al.*, 2008). Prognostic factors of significance include grading (cytology and histopathology), staging (regional and distant metastases), and location of tumour; patient signalment and treatment options (surgery, radiation and chemotherapy) also affect prognosis. Cytological examination after fine needle aspiration is useful in establishing the diagnosis but histopathology is needed for grading (Bronden *et al.*, 2010). In this case diagnosis was done on the basis of cytological examination supported with haematological parameters. Cytological examination found mast cells with numerous metachromatic stained granules. Nuclei were varied in size and shape with high nuclear to cytoplasmic ratio, prominent nucleoli, marked atypical and mitotic figures. Histopathological study of the tumour sample revealed numerous fine eosinophilic to basophilic cytoplasmic granules inside the neoplastic cells. There were also highly pleomorphic tumour cells with high mitotic index and anisokaryosis. The prognosis for dog with mast cell tumours depends on the grade and stage of tumour. A successful wide first surgery is the most valuable prognostic factor for mast cell tumours. The use of radiation therapy, chemotherapy or other novel therapies can lower the rate of recurrence.

Conclusion

Mast cell tumour is one of the most common skin tumours of the dog. Easy and rapid diagnosis is possible with fine needle aspiration and cytological examination. In the present case surgical excision followed by chemotherapy was found successful for management of the condition.

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