

INTRODUTCTION

Mast cell tumors (MCTs) or mastocytomas are common skin neoplasms, frequently seen in dogs and less often in other animals. It accounts for 16-21% of all skin malignancies in the dog (London et al., 2013). Studies indicate that older dogs are more susceptible to MCTs with a mean age of 9 years with no sex predilection. (Moore and Frimberger, 2016). Any breed may be affected with MCTs but certain breeds are predisposed, including Golden Retriever, Labrador Retriever, Boston Terriers, Boxer and Pugs. But Pugs are more likely to have multiple MCTs at diagnosis and in the most cases tumors were demonstrated more benign behavior and rarely lead to death (Garrett, 2014). MCTs develop most frequently in the skin, but they can grow anywhere of the body including the intestines, liver, or spleen. The involvement of bone, larynx and tracheobronchial lymphnodes are also reported (Takahashi et al., 2000). However, mast cell leukemia is rare in the dog (Pelt et al., 1986).

Cutaneous MCTs have a wide range of gross appearances, from raised well-circumscribed mass and superficial to very deep and fixed, and may be red, ulcerated, or swollen. The frequent sites of occurrence of MCTs in dog are the skin of the extremities, trunk and perineal region. The biological behavior of these tumors can vary widely; some may be present for many months without growing much, while others can appear suddenly and grow very quickly. The most common sites of MCT spread (metastasis) are the lymph nodes, spleen, and liver (<https://www.vet.upenn.edu/>). Mast cell containing granules filled with substances which can be released into the blood stream and potentially cause systemic problems, including stomach ulceration and bleeding, swelling and redness at and around the tumor site (Philadelphia et al., 2017). MCTs have been classified according to their degree of proliferative. The higher the grade, the more aggressive the tumor (Moore and Frimberger, 2016).

Most MCTs are easily diagnosed with fine needle aspiration. (Jackson et al., 2013). But histological grading of the tumor in association with clinical staging helps the clinicians to choose an appropriate treatment. Surgical treatment is also recommended for stage 1 solitary tumors (Pelt et al., 1986).

The present report describes the clinical and cytological findings of a case of MCT in a dog along with its treatment.

CASE DESCRIPTION

A ten-year-old golden colored Golden Retriever weighing 30 kg was presented to the Teaching and Training Pet Hospital and Research Center at Purbachal, Dhaka with a history of persistent firm raised circumscribed mass on the skin of the thigh region for the last three months. On physical examination, the dog was found in good condition, and the temperature, respiratory-, pulse- and heart rate were found within normal ranges. The appetite of the patient was normal. A tumor-like mass was detected on the cranial aspect of the thigh region. In palpation, it was hard in consistency with a broad sessile-based and lobulated that occupied on the skin of thigh (Figure 1). The surface of skin was dry and hard. Clinical examination was revealed no other abnormalities.

Diagnosis

A tentative diagnosis was made from the needle aspiration in the tumor mass. Fresh blood was found in needle aspiration, indicating the presence of a tumor, and differentiating it from abscess, cyst, and hematoma. (Figure 2). Finally, a mast cell tumor was confirmed by cell cytology of mass (Figure 3).

Anesthesia and Surgical Procedure

Surgical repair was conducted by aseptic preparation of the surgical site. The patient was sedated using xylazine hydrochloride administered intramuscularly @ 1mg/kg body weight, and the entire operation site was prepared for aseptic surgery by shaving, scrubbing using povidone iodine on the skin (Figure 4 and Figure 5). General anesthesia was performed by the combination of ketamine and diazepam at the ratio of 4:1 in intravenous route followed by fluid therapy and was maintained by using general anesthetics (Figure 6). Following draping, an elliptical skin incision was given, and entire tumorous mass was removed by blunt dissection of the tissues (Figure 7 and Figure 8). Major blood vessels were also ligated to reduce the bleeding during operation period. The subcutaneous tissues were then sutured continuously with No. 1-0 chromic catgut and excessive skin was removed for better apposition and finally sutured with No. 2 silk (Johnson & Johnson, India) in a simple interrupted suture pattern (Figure 9).

Postoperative Management

After surgery, medication was given to the dog. Antibiotic ceftriaxone was given intramuscularly at a dose of 50 mg/kg body weight once daily for 7 days. Meloxicam and

pheniramine maleate were administered intramuscularly at the rate of 0.2mg/kg body weight for 5 days. No complication was noted and the dog had an uneventful recovery.

DISCUSSION

The majority of MCTs is cured with surgical excision. Prognostic factors for predicting MCTs that will exhibit a more aggressive biologic behavior, *i.e.* tumors that will not be cured despite local excision and that will ultimately lead to the patient's death are varied as well as controversial. When to pursue staging tests in dogs with MCTs, which tests to perform, and treatment recommendations beyond surgery are based on the predicted biologic behavior of the tumor, with staging diagnostics and systemic therapy the recommendation for dogs with biologically aggressive MCTs (Baginski et al., 2014)

MCTs are located in the perineal, preputial or inguinal regions are more likely to recur or metastasize than tumors found in other sites of the body (Misdorp, 2004). Boxers and related breeds of common ancestor are in general at increased risk for well differentiated mast cell tumors and various other tumors sarcoma, gliomas,vascular tumors (Misdorp, 2004).

The prognosis for cutaneous MCT is dependent upon several factors, including tumor grade, tumor stage, and ability to perform a complete surgical excision. Dogs that have had prior MCT are at greater risk for developing additional primary mast cell tumors. Early tumor detection and addressing tumors when they are small and localized increases the likelihood of treatment success and cure. For tumors that have spread distantly (beyond the lymph nodes), or those that occur in locations other than the skin (such as the gastrointestinal tract, spleen or liver), the prognosis is generally poor. The goal of treatment for these patients is to maintain a good quality of life for as long as possible with palliative therapy aimed at controlling symptoms caused by the MCT in the body (Eiston et al., 2009).

Pictorial presentation of some activities during surgery



Figure 1: A tumor-like mass on the skin of thigh region



Figure 2: Tumor detection by needle aspiration

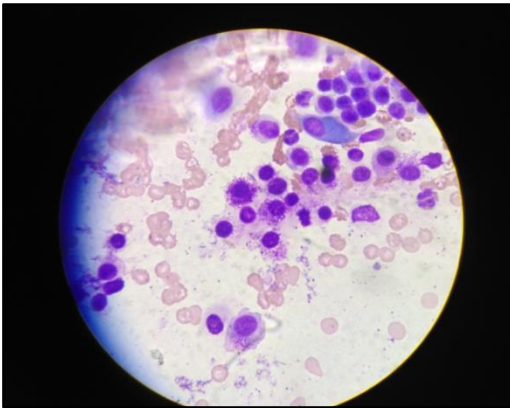


Figure 3: Microscopic view of tumor mass



Figure 4: Shaving of the surgical site



Figure 5: Disinfection of the surgical site by using povidone iodine and alcohol



Figure 6: General anesthesia by using ketamin and diazepam

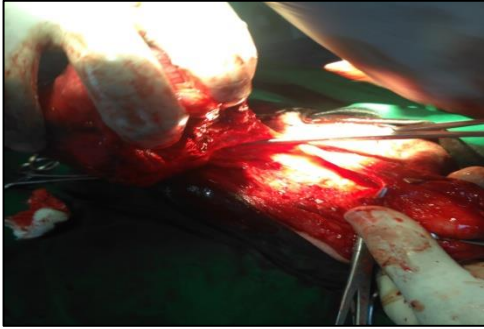


Figure 7: Removal of the tumor from the body of dog

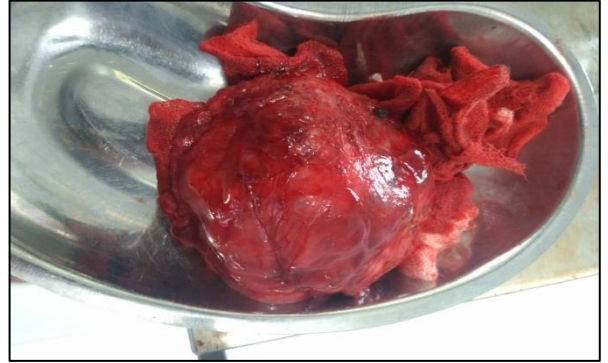


Figure 8: Gross view of the tumor after removing

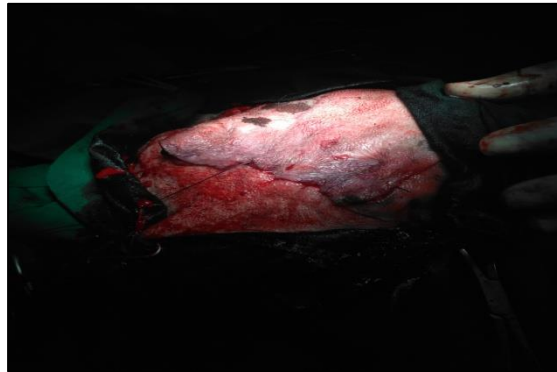


Figure 9: Simple interrupted suture in skin

CONCLUSION

The mast cell tumor is one of the most common skin tumors frequently seen in dogs. Fine needle aspiration in conjunction with cytological examination aids the practitioner to tentatively diagnose the case rapidly. This study demonstrates that if a mast cell tumor is diagnosed in its early stages and removed by an appropriate surgical approach, local recurrence and systemic spread can be prevented and the prognosis may be satisfactory.

REFERENCES

- Baginski H, Davis G, Bastian RP. 2014. The prognostic value of lymph node metastasis with grade 2 MCTs in dogs: 55 cases (2001-2010). *J Am Anim Hosp Assoc.* 50:89-95.
- Elston L, Sueiro FA, Cavalcanti J, Metze K. 2009. The importance of the mitotic index as a prognostic factor for canine cutaneous mast cell tumors: a validation study. *Vet Pathol.* 46:362–364.
- Garrett L. 2014. Canine mast cell tumors: diagnosis, treatment, and prognosis. *Vet Med (Auckl).* 5:49-58
- Jackson DE, Selting KA, Spoor MS, Henry CJ, Wiedmeyer CE. 2013. Evaluation of fixation time using Diff-Quik for staining of canine mast cell tumor aspirates. *Vet Clin Pathol.* 42:99-102.
- London CA, Thamm DH. 2013. Mast cell tumors. In: Withrow SJ, MacEwen EG, editors. *Small Animal Clinical Oncology*. 5th ed. Philadelphia: Saunders. p. 335–55.
- Misdorp W. 2004. Mast cells and canine mast cell tumors: a review. *Vet Q.* 26:156-169.
- Moore, AS, Frimberger AE. 2016. Mast Cell Tumor in Dogs. In *Oncology for Veterinary Technicians and Nurses* (eds A.S. Moore and A.E. Frimberger).
- Pelt DR, Fowler JD, Leighton FA. 1986. Multiple cutaneous mast cell tumors in a dog: a case report and brief review. *Can Vet J.* 27:259-263.
- Philadelphia, Theon AP, Werner JA, McEntee. 2017. Biologic behavior and prognostic factors for mast cell tumors of the canine: 24 cases (2005–2018). *J Vet Intern Med.* 17:687–692.
- Takahashi T, Kadosawa T, Nagase M, et al. 2000. Visceral mast cell tumors in dogs: 10 cases (1982-1997). *J Am Vet Med Assoc.* 216:222–226.

ACKNOWLEDGEMENT

The author is ever grateful and indebted to the Almighty God without whose grace it would have never been possible to pursue this study in this field of science and to complete this clinical report writing for the Degree of Doctor of Veterinary Medicine (DVM).

The author would like to thank his reverend and beloved teacher and supervisor **Professor Dr. Himel Barua**, Department of Microbiology and Veterinary Public Health, Chattogram Veterinary and Animal Sciences University for his valuable advice, suggestions and kind co-operation during the study period.

The author would like to thank to the Director of External affairs **Professor Dr. A.K.M. Saifuddin**, Department of Physiology, Biochemistry & Pharmacology, Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Sciences University for his suggestion.

The author expresses his sincere gratitude and gratefulness to **Dr. Mir Md. Afzal Hossain** and **Dr. Mohammad Bayazid Bostami** from Teaching and Training Pet Hospital and Research Center of CVASU in Purbachal, Dhaka for their valuable advice, inspiration, cordial co-operation, valuable suggestion during the study period.

The Author

September 2020

BIOGRAPHY

I am **Tuhin Alam Dipu**, an intern student at Chattogram Veterinary and Animal Sciences University (CVASU), originate from Chandpur district. After completing one year intern period, I will receive my Doctor of Veterinary Medicine (DVM) degree with lots of real life experiences. I have an interest on veterinary anesthesiology and small animal surgery.