

**MANAGEMENT OF MASTICATORY MUSCLE MYOSITIS WITH THERAPEUTIC
ULTRASOUND IN A DOG – A CASE REVIEW**Carmel Prins^{1*}, Vigneswari M.², Tina Roshini S.², Gurunathan N.², Arul Jothi N.³ and Vedhavani N.⁴¹Undergraduate student, Rajiv Gandhi Institute of Veterinary Education and Research²Assistant Professor, Dept. of Veterinary Surgery and Radiology,³Professor and Head, Dept. of Veterinary Surgery and Radiology,⁴M.V.Sc. Scholar, Dept. of Veterinary Surgery and Radiology,

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ABSTRACT

Masticatory muscle myositis is an immune mediated myopathy affecting dogs characterized by trismus and clinical signs restricted only to the muscles of mastication. A 7-year-old intact male non-descript dog was presented with a history of inability to open the mouth and excessive salivation. The haematological and biochemical parameters were within the normal range with an exception of elevated eosinophil count and creatinine kinase. The case was diagnosed as Masticatory muscle myositis and treated with Inj. Prednisolone @ 1mg/kg for 5 days followed by oral Prednisolone in tapering doses along with therapeutic ultrasound massage at 1 W/cm² every alternate day, following which, the dog made an uneventful recovery.

KEYWORDS: Masticatory muscle myositis, Trismus, Therapeutic Ultrasound.**INTRODUCTION**

Masticatory muscle myositis is an immune mediated myopathy affecting dogs. Auto-antibodies against the Type 2M muscle fibres located in the masticatory muscles can be detected in the circulation (Kang *et al.*, 2014). The condition is characterized by trismus and bilateral atrophy of the muscles of mastication which are the masseter, temporalis, pterygoid and rostral digastricus muscles. Electromyography of the temporal and masseter muscles revealed pathological changes whereas no pathological activity was observed in the other muscles (Cauduro *et al.*, 2013). Absence of other physical or neurological signs in affected dogs help in differentially diagnosing the condition from others causing trismus such as myopathies due to trauma or endocrine dysfunction, trigeminal nerve neuropathies and other diseases related to muscle atrophy (Nanai *et al.*, 2009).

This disease was called eosinophilic myositis or atrophic myositis and although these names suggest a different pathogenesis, they likely represent the acute and chronic phases of masticatory muscle myositis (Melmed *et al.*, 2004). The acute form is clinically manifested as inability to open the jaw, pain, difficulty in prehension

and swelling. The chronic form shows varying degrees for muscle atrophy and fibrosis. Biochemical changes reported in affected dogs include elevated creatinine kinase, mild anaemia, hyperglobulinemia and proteinuria (Gilmour *et al.*, 1992). Some dogs show peripheral eosinophilia because eosinophils are the predominant cell type infiltrating the masticatory muscle but it is not a consistent finding (Karan *et al.*, 2019). This article describes the clinical findings, diagnosis, treatment and outcome of a case of masticatory muscle myositis in a non-descript dog.

MATERIALS AND METHODS

A 7-year-old intact male non-descript dog was presented to the Department of Veterinary Surgery and Radiology of the Veterinary Clinical Complex, Rajiv Gandhi Institute of Veterinary Education and Research, Puducherry with a history of inability to open the mouth and excessive salivation. The dog was unable to take solid food and showed pain during prehension. On clinical examination, all the vital parameters (rectal temperature, heart rate, respiratory rate, capillary refill time) were within the normal range. There was marked atrophy of the temporalis and masseter muscles and rigidity of the jaws (Fig 1).



Fig. 1: Atrophy of the Temporalis and Masseter muscle in a dog affected with masticatory muscle myositis.

A complete physical and neurological examination revealed that the clinical signs were restricted only to the muscles of mastication. The haematological and biochemical parameters were within the normal range with the exception of elevated creatinine kinase 456 U/L (Reference interval 52 – 368U/L) and mild peripheral eosinophilia of 10% (Reference interval 0-9%). The case was diagnosed as masticatory muscle myositis.

The dog was treated with Inj. Prednisolone acetate @ 1mg/kg sid for 5 days followed by oral Prednisolone (WYSOLONE®) given in tapering doses over the next two weeks. Supportive treatment with Inj. Cefotaxime

sodium (TAXIM®) @ 20mg/kg IV daily for 5 days was also given. Therapeutic ultrasound massage @ 1 W/cm² every alternate day was performed (Fig 2). Within 3 days of treatment the dog was able to slightly open the mouth and protrude the tongue (Fig 3). Following the treatment, the symptoms gradually reduced and the animal could masticate normally. Haematological and biochemical parameters were within normal range with decrease in creatinine kinase level (170U/L). After 2 weeks of corticosteroid therapy and therapeutic ultrasound massage, the dog regained 90% of its jaw function and made an uneventful recovery.



Fig. 2: Ultrasound massage being performed.



Fig. 3: Animal showing the mouth slightly open on the 3rd day of treatment.

RESULTS AND DISCUSSION

Masticatory muscle myositis results due to the initiation of an immune reaction against the Type 2M muscle fibres which are unique to the muscles of mastication (Nanai *et al.*, 2009). The exact reason for the initiation of the immune reaction and its specificity to the Type 2M muscle fibre remains unknown. Although it has been hypothesized that molecular mimicry may play a role, with antibodies or T cells generated in response to an infectious agent that subsequently cross-reacts with self-

antigens. Thus, antibodies directed against bacterial antigens could potentially cross-react (Melmed *et al.*, 2004).

Masticatory muscle myositis may affect dogs of any age, sex or breeds but large breeds with overrepresentation of breeds such as German shepherds, Labrador retrievers, Doberman pinschers, and Golden retrievers, are more commonly affected (Taylor, 2000). Treatment of the condition using immune-modifying doses of

corticosteroids resulted in resolution of the clinical signs (Pitcher and Hahn, 2007). Previous reports of forcible retraction of the jaw using anaesthesia in a pug resulted in inadvertent tongue protrusion, venous occlusion, and marked tongue swelling that became life threatening (Nanai *et al.*, 2009) and is hence contraindicated.

Therapeutic Ultrasound is a form of acoustic energy commonly used in physical therapy having a range of biological effects depending on the intensity of ultrasonic waves used (Haar, 2007). In this case, therapeutic ultrasound massage was performed in addition to the conventional corticosteroid therapy to enhance the rate of recovery by providing pain relief and increase jaw functionality.

CONCLUSION

Masticatory muscle myositis is an immune mediated myopathy in dogs characterized by trismus and bilateral atrophy of the masticatory muscles. Early detection and diagnosis of the condition and aggressive corticosteroid therapy along with therapeutic ultrasound massage in dogs suffering from masticatory muscle myositis is an effective method of treatment with good prognosis.

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REFERENCES

1. Cauduro, A., Paolo, F., Asperio, R. M., Rossini, V., Dondi, M., Simonette, L. A., Cantile, C., and Lorenzo, V. Use of MRI for the early diagnosis of masticatory muscle myositis. *JAAHA*, 2013; 49(5): 347-352.
2. Gilmour, M.A., Morgan, R.V., and Moore, F.M. Masticatory myopathy in the dog: a retrospective study of 18 cases. *JAAHA*, 1992; 28(4): 300-306.
3. Kang, B., Rhew, D., Kim, Y., Lee, S., Kim, W.H., and Kweon, O. Masticatory muscle myositis in a Maltese dog. *J Vet Clin*, 2014; 31(3): 223.
4. Karan, B., Karabağh, M., Özer, K. Canine masticatory myositis in a Rottweiler breed dog. *J Adv VetBio Sci Tech*, 2019; 4(2): 67-71.
5. Melmed, C., Shelton, G., Bergman, R., and Barton, C. Masticatory muscle myositis: Pathogenesis, diagnosis, and treatment. *Comp Cont Educ Pract Vet-North American Ed*, 2004; 26(8): 590-605.
6. Nanai, B., Phillips, L., Christiansen, J., and Shelton, G. Life Threatening Complication Associated with Anesthesia in a Dog with Masticatory Muscle Myositis. *Vet Surg*, 2009; 38(5): 645-649.
7. Pitcher, G., and Hahn, C. Atypical masticatory muscle myositis in three cavalier King Charles spaniel littermates. *J Small Anim Pract*, 2007; 48(4): 226-228.
8. Taylor, S. Selected Disorders of Muscle and the Neuromuscular Junction. *Vet Clin North Am.: Small Anim Pract*, 2000; 30(1): 59-75.
9. ter Haar, G., Therapeutic applications of ultrasound. *Prog Biophys Mol Biol*, 2007; 93(1-3): 111-129.