

SUCCESSFUL THERAPEUTIC MANAGEMENT OF HYPERTROPHIC OSTEODYSTROPHY IN THREE NEOPOLITAN MASTIFF LITTERMATES

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Three Neopolitan Mastiff littermates aged three months were presented to the Teaching Veterinary Clinical Complex, Mannuthy with the history of puppies being recumbent for past 5 days of presentation. Anamnesis revealed the occurrence of high fever and diarrhoea one week before. On examination the puppies were found to be recumbent and cachectic with firm swellings on the carpal and stifle joints. Radiographic findings were suggestive of periosteal reactions and soft tissue swellings around the metaphyses of long bones pertaining to the features of hypertrophic osteodystrophy (HOD). Two separate treatment strategies were adopted for the three puppies. The male puppy was treated with corticosteroid and antibiotic while other two female puppies were treated with antibiotic therapy alone. An uneventful recovery was observed in case of male puppy on 3rd day suggesting the effectiveness of corticosteroid therapy and later the same treatment was adopted to other puppies which also showed complete recovery.

Keywords: Hypertrophic Long bones, Osteodystrophy (HOD), Periosteal reactions.

Hypertrophic Osteodystrophy or Metaphyseal Osteopathy is a developmental skeletal abnormality in fast growing heavy dog breeds occurring at 2-8 months of age. The disease manifestations include anorexia, depression, fever, symmetrical lameness, recent diarrhoea, warm and painful enlargements of the metaphyses of long bones (Abeles *et al.*, 1999). The severity of acute onset of lameness varies from mild limping to complete reluctance to stand or walk (Miller 2001). The underlying etiology of the disease is unknown, although there are reports of several factors like oversupplementation of vitamins and minerals, infectious agents like *Escherichia coli* (Schulz *et al.*, 1991), high calcium diet (Abeles *et al.*, 1999) and Canine Distemper virus vaccination (Baumgärtner *et al.*, 1995) also contribute to the pathogenesis. This paper describes the successful medical

management of HOD in three Neopolitan Mastiff littermates with corticosteroid therapy followed by NSAIDs in tapering doses along with antibiotic.

Case History and Observations

Three non-ambulatory, dull and depressed Neopolitan Mastiff littermates aged three months with considerable muscle wasting were presented at TVCC, Mannuthy. All the three puppies exhibited firm and swollen carpal joints with pain on palpation. The male puppy in addition had a swollen stifle joint that elicited pain on palpation. Past history revealed diarrhoea and high fever before one week, followed by acute onset of lameness that progressed to recumbency. The puppies had normal appetite and were maintained on cooked chicken and rice along with pelleted grower food and calcium supplementation.

Table 1. Details of physical examinations in 3 puppies

Parameters	Puppy 1	Puppy 2	Puppy 3
Sex	Male	Female	Female
Body weight (Kg)	18	17.8	17.8
Age(months)	3	3	3
Rectal temp(°F)	102.6	103.1	102
Pulse rate (per min)	94	92	95
Resp rate(per min)	36	37	40

Table 2. Details of orthopaedic and neurological examination

Orthopaedic tests	Puppy 1	Puppy 2	Puppy 3
Wheel Barrow Test	-ve	-ve	-ve
Hemi-stand	-ve	-ve	-ve
Hemi-walk	-ve	-ve	-ve
Pain on palpation of swollen joints	+ve	-ve	-ve
Neurological Tests	Puppy 1	Puppy 2	Puppy 3
Pedal reflex	-ve	-ve	-ve
Deep pain reflex	sluggish	-ve	sluggish
Patellar reflex	+ve	+ve	+ve
Conscious proprioception	sluggish	-ve	-ve
Hyperpathiae	-ve	-ve	-ve
Panniculus	-ve	-ve	-ve

The haematological parameters of the three puppies were alike with mild leucocytosis and anaemia. The serum biochemical profiles were also within the normal range, except for the higher

concentrations of phosphorus and alkaline phosphatase but cannot be confirmed and may also be attributed to the hyperphosphataemia and elevated alkaline phosphatase routinely detected in juvenile animals.

Table 3. Results of haematology and serum biochemistry

Parameters	Puppy 1	Puppy 2	Puppy 3
WBC ($10^3/\mu\text{L}$)	17.6	18.4	22
RBC ($10^6/\mu\text{L}$)	3.68	3.92	4.18
Platelet ($10^3/\mu\text{L}$)	431	383	575
HGB (g/dL)	9.2	9.6	8.3
BUN (mg/dL)	11.4	12.51	12.2
Creatinine (mg/dL)	0.6	0.9	0.82
ALT (IU/L)	36.2	45.76	52.4
ALP (IU/L)	327.2	315.4	322.3
Calcium (mg/dL)	10.1	10.3	10.5
Phosphorus (mg/dL)	8.4	9.3	8.7
Albumin (g/dL)	2.6	2.7	2.5
A:G ratio	1.44	0.93	1.13

Radiography of medio-lateral view of hind limbs suggested early signs of periosteal reactions on the distal extremities of femur and tibia giving a typical radiolucent appearance with elevated periosteal linings of these long bones (Fig.1). Osteolytic changes consistent with HOD were observed on the ventro-median view of hip joint (Fig.2). Increased radiolucency was evident on the distal extremity of radius along with soft tissue swelling on carpal joint(Fig.3).

Treatment

Two different treatment regimen was adopted for the three littermates. The male puppy (puppy1) was administered a single dose of Methyl prednisolone acetate @ 1mg/kg on day 1, followed by a tapering dose of Meloxicam @ 0.2mg/kg on day 2 and 0.1mg/kg on day 3 under the protective coverage of antibiotic Ceftriazone - Tazobactam @ 20mg/kg for 3 days. Other two female puppies (puppy 2 & puppy 3) were maintained on antibiotic alone for 3 days without any corticosteroids. Proton pump inhibitor, Pantoprazole @ 1mg/kg were administered to all the three puppies to

prevent any gastrointestinal disturbances. An

uneventful recovery was made by the male



Fig.1 Periosteal reactions and increased radiolucency on distal extremities of femur and tibia



Fig.2. Osteolytic changes in proximal and distal extremities of femur



Fig.3 Early closure of epiphyseal cartilage

puppy on day 3, while no improvement was observed in case of other two female puppies and was still found to be recumbent. The female puppies later underwent the same corticosteroid therapy and meloxicam regimen and started normal ambulation at day 2 of treatment, suggesting the effectiveness of corticosteroid and NSAIDS for the condition.

After discontinuing the above treatment, on a review after one week the puppies showed normal ambulation and neurological and orthopaedic examinations revealed

satisfactory results. Pain was elicited only on palpation of hip joint and manipulation of carpal and stifle joints were well tolerated. Oral medication consisting of rimadyl@5mg/kg OD and tablet combination of glucosamine hydrochloride 500mg, chondroitin sulphate 400mg, manganese sulphate 5mg, *Boswellia serrata* 50mg, *Withaniasomnifera* 50mg and vitamin C 12.5mg@ 1 tab BID were prescribed as follow up therapy. Dietary regulation was made by advising a Ragimillet based diet.



Fig. 4 showing one of the recumbent pup on day1. Note the swollen carpal joints

Discussion

This paper describes the rare case of hypertrophic osteodystrophy in three Neopolitan Mastiff littermates of its kind. The response to corticosteroid therapy suggests the presence of an underlying inflammatory process triggering the progress of the disease and dampening of this process restricted the

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expression of disease as also reported by Abeles *et al.* (1999). Radiographic appearance of a radiolucent line just above the physes referred to as double physal line is a predominant finding in HOD as also recorded by Hill *et al.* (2015), although it may not be evident in all stages of the disease. The treatment methodology is conservative and

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non-specific aimed at managing the pyrexia and bone repair using steroids or Non Steroidal Anti Inflammatory Drugs (NSAIDS) as also suggested by Safra *et al.*, (2013) and Hill *et al.* (2015). The studies so far on HOD propose a good prognosis for mildly affected puppies and a guarded one for the severely affected ones.

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