

## DIAGNOSTIC AND THERAPEUTIC MANAGEMENT OF OTODEMODICOSIS AND GENERALIZED DEMODICOSIS IN 2 DOGS

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**Abstract:** Out of 42 dogs presented with the symptoms of otitis externa, 5 dogs were with dermatological lesions, of which 2 dogs were suffering from generalized demodicosis along with otodemodicosis as the otic discharge also revealed demodectic mites, *Malassezia*, cocci and degenerated neutrophils. Haematology revealed leukocytosis, neutrophilia, lymphopenia & eosinophilia. Both dogs were treated daily with oral ivermectin @ 300 – 600 µg/kg body wt, ear drops containing clotrimazole and ofloxacin. Petben shampoo was advised for bathing. In one dog, it took 21 days and 35 days for the recovery of otodemodicosis and generalized demodicosis respectively. In the other, it took 28 days (otodemodicosis) and 42 days (generalized demodicosis).

**Keywords:** Clotrimazole, Ivermectin, *Malassezia*, Otodemodicosis.

### Introduction

Demodicosis is a relatively common disease and is associated with proliferation of mite *Demodex canis*, which is normal inhabitant of follicles and sometimes sebaceous glands (Singh *et al.*, 2011). Otocariasis is infestation of external ear canal by ticks or mites and is characterized by otitis externa (Bedford 1991). Otitis externa is a multifactorial disorder and its causative factors have been classified as predisposing factors, primary causes, perpetuating factors and secondary causes. The present paper is a report of generalized demodicosis and otitis externa due to demodex mites as primary cause, cocci and *Malassezia* as secondary causes in 2 dogs.

### Materials and Methods

Forty two dogs of various breeds with the symptoms of otitis externa were presented to the Veterinary College hospital, Tirupati, of which five dogs also had dermatological lesions.

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Among them two dogs had generalized demodicosis which was diagnosed by skin scrapings, hair pluck examination and otic discharge also revealed demodectic mites (40 X). Otic discharge on examining under oil immersion objective (100 X) after staining with new methylene blue revealed *Malassezia* and bacterial cocci. Whole blood sample was collected for estimation of total leukocyte count, differential leukocyte count and haemoglobin and serum sample for the estimation of total proteins, triglycerides and total cholesterol. Ear cleaning was done after the instillation of ceruminolytic agents. Affected ears were gently irrigated with normal saline by using an urinary catheter and repeated flushing was done until the fluid emerging from the ear canal was clean. Treatment was instituted with oral ivermectin tablets at a dose rate of 300 – 600 µg/kg body weight as incremental doses looking for any adverse reactions, topical application of benzoyl peroxide shampoo weekly once and ear drops containing clotrimazole and ofloxain at a dose rate of 5 drops twice a day (Kiss *et al.*, 1997). Ivermectin was used for two more weeks, even after negative skin scrapings as stated by Ristic *et al.*, (1995). Ear drops were advised to be used upto 7 days and benzoyl peroxide shampoo for 2 more months even after the complete clinical cure.

### **Results and Discussion**

In the present investigation, out of forty two dogs with otitis externa due to various causative agents, five dogs also had dermatological lesions, of which 2 dogs (4 ears) were diagnosed to be suffering from demodicosis infection over the body as well as in the otic discharge. They were presented with the history of hair loss, foul smell from the body, head shaking, moderate pruritus and ear scratching since 2 months. One was a male pug (5 years) with deep folliculitis, hyperpigmentation and alopecia all over the body and the other was Pomeranian (8 years) with erythematic lesions and alopecia over the face and trunk. Both dogs had been treated with different combination of drugs earlier. Deep skin scrapings and hair plucks readily revealed more than five live demodectic mites per every field on low power objective (10X) indicating severe infection (Fig.1). Demodectic mites were observed in the otic discharge of both dogs (4 ears) indicating bilateral otocariasis leading to otitis externa (Fig. 2). August (1988) stated that sporadic causes of refractory ceruminous otitis externa in dogs were due to demodectic otocariasis, and smears of cerumen reveal large number of adult demodectic mites.

In addition *Malassezia* organisms (> 4 organisms / OIF) along with cocci and degenerated neutrophils were observed on cytological examination of otic discharge in oil immersion objective (100X). Cole *et al.*, (1998) reported that the mean number of *Malassezia* organisms

/ OIF  $\geq$  4 in otic discharge was considered as pathogenic. Ginel *et al.*, (2002) stated that white blood cells and phagocytosis of the bacteria in the otic discharge are signs that the body is responding to the infection and that treatment of the bacterial infection should be attempted.

Haematology (Table 1) revealed leukocytosis as also reported by Dadhich and Khanna (2008). Differential leukocyte count showed neutrophilia, lymphopenia and eosinophilia. The neutrophilia observed in the present study corroborates with the finding of Pradhan *et al.*, (2012) who reported that there was significant increase in neutrophil count in demodectic dogs. Another finding of eosinophilia was supported by Dimri *et al.*, (2000) who opined that *Demodex canis* causes irritation and stimulates the mast cells for release of more histamine and since histamine is chemotactic for eosinophils from the bone marrow to the circulation leading to eosinophilia. Serum bio chemical results were estimated in order to identify any underlying causes as stated by (Rosser, 1988) however, they were within the normal range.

In both dogs, ear cleaning was done prior to the application of medicament in all the affected ears as the purulent material and inflammatory debris may inactivate some antimicrobial medications such as gentamicin and polymyxin B (Rosychuk, 1994). They were treated once daily with oral ivermectin (tablets) for the otocariasis due to *Demodex* mites and generalized demodicosis at a dose rate of 300 – 600  $\mu$ g/kg body weight as incremental doses, looking for any adverse reactions as suggested by Gotel (2006). Otitis externa due to *Malassezia* and bacterial cocci was treated with ear drops containing clotrimazole and ofloxacin. Petben (Benzoyl Peroxide) shampoo was advised for bathing, because of its keratolytic and supposed follicular flushing activity (Scott *et al.*, 2001).

By 7<sup>th</sup> day, in both the dogs head shaking, foul smell from the body, pruritus and ear scratching were reduced but, few live demodectic mites and dead mites were observed in scrapings, hair plucks and otic discharge. The number of *Malassezia* organisms and cocci were also reduced. In one dog (Pomeranian), otitis externa was completely reduced by 21<sup>st</sup> day, which was evident by clinical recovery, absence of mites in the otic discharge and cytological recovery (The number of Malassezial organisms/oil immersion field in the roll swab sample were normal i.e < 2organisms/ field). However, it took 35 days for complete clinical recovery from generalised demodicosis which was evidenced by absence of mites in skin scrapings and good regrowth of hair. In another pug, it took 28 days for complete regression of symptoms of otodemodicosis and 42 days for the recovery from generalized demodicosis.

## Conclusion

In the present study, two dogs with generalized demodicosis also had otodemodicosis with live demodectic mites, *Malassezia* and bacterial cocci in the ear discharge. Hence, it can be concluded that in the dogs with generalized demodicosis otic discharge should also be checked for the possible presence of mites (otodemodicosis). However, both the dogs were successfully treated with oral ivermectin tablets, benzoyl peroxide shampoo, ear drops containing clotrimazole and ofloxain. The duration of therapy was about 21 days for otodemodicosis and 35 days for generalized demodicosis in a Pomeranian dog. It took about 28 days and 42 days for the complete cure of otodemodicosis and generalized demodicosis respectively in the another dog.

## References

- [1]. August, J. R., (1988) Diseases of the ear canal. *Veterinary Clinics of North American Animal Practice.*, 18 (4): 731-742.
- [2]. Bedford, P.G.C., (1991) Ear, Nose, Throat and Mouth. In: *Canine Medicine and Therapeutics*, Edited by Chandler E A, Thompson D J, Sutton J B, and Price C J. 3<sup>rd</sup> edition. BSAVA, Blackwell Scientific Publications, London. P.77-122.
- [3]. Cole, L. K., Kwochka, K. W., Kowalski, J. J. and Hillier, A., (1998) Microbial flora and antimicrobial susceptibility patterns of isolated pathogens from the horizontal ear canal and middle ear in dogs with otitis media. *Journal of the American Veterinary Medical Association.*, 212: 534–538.
- [4]. Dadhich, H. and Khanna, R. (2008) Pathological, Haemato-biochemical and Immunological studies of cutaneous ectoparasitoses in dogs. 15<sup>th</sup> Congress of FAVA-OIE Joint Symposium on Emerging Diseases, Thailand.
- [5]. Dimiri, U., Sharma, M. C., Kalicharan. and Dwivedi, P. (2000) Clinicobiochemical and Histopathological alterations in demodectic mange in canines with special reference to ivermectin therapy. *Indian Journal of Veterinary Pathology.*, 24:23-25.
- [6]. Ginel, P. J., Lucena, R., Rodriguez, J. C. and Ortega, J. (2002) A semiquantitative cytological evaluation of normal and pathological samples from the external ear canal of dogs and cats. *Veterinary Dermatology.*, 13: 151–156.
- [7]. Kiss, G., Radvanyi, S., Szigeti, G., Lukats, B. and Nagy, G. (1997) New combination for the therapy of canine otitis externa II - Efficacy in vitro and in vivo. *Journal of Small Animal Practice.*, 38 (2): 57-60.

- [8]. Gortel, K. (2006) Update on canine demodicosis. *Veterinary Clinical Small Animal Practice* 36: 229-241.
- [9]. Pradhan, N. R., Chatterjee, S. and Lodh, C. (2012) Demodicosis in dogs and its therapeutic management. *Indian Journal of Canine Practice.*, 4(1):44-48.
- [10]. Ristic, Z., Medleau, L., Paradis, M. and White-weithers, N. E. (1995) Ivermectin for treatment of generalized demodicosis in dogs. *Journal of the American Veterinary Medical Association.* 207:1308-1310.
- [11]. Rosser, E.J. (2004) Causes of otitis externa. *Veterinary Clinics of North America Small Animal Practice.* 36: 203-211.
- [12]. Rosychuk, R. A. W. (1994) Management of otitis externa. *Veterinary Clinics of North America, Small Animal Practice.*, 24: 921-952.
- [13]. Scott, D.W., Miller, W.H. and Griffin, C. E. (2001) Diseases of the eyelids, claws, anal sacs and ears. *In Small Animal Dermatology.*, 6<sup>th</sup> Edn, Philadelphia, W B Saunders, pp: 71 - 1235.
- [14]. Singh, S. K., Kumar, M., Jadav, R. K. and Saxena, S. K. (2011) An update on Therapeutic Management of Canine Demodicosis. *Veterinary World.*, 4: 41-44.

**TABLE.1 HAEMATOLOGICAL VALUES OF TWO DOGS**

S.No	Blood Parameter	Pomeranian	Pug
1.	TLC / $\mu$ L	19,400	22,300
2.	DLC / $\mu$ L Neutrophils	76	79
3.	Lymphocytes	20	15
4.	Eosinophils	4	6
5.	Basophils	0	0
6.	Monocytes	0	0

**LIST OF FIGURES**

Fig. 1: > 8 demodectic mites in trichogram (40X)



Fig. 2: Demodectic mites in otic discharge



Generalised demodicosis - Before therapy



Complete recovery after therapy