

## CLINICAL DIAGNOSIS IN CANINE DEMODICOSIS. A NEW APPROACH

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### Abstract

*Canine demodicosis is caused by Demodex canis mite found in hair follicles. Demodicosis is a nonpruritic dermatosis which frequently becomes pustular by bacterial complications. The evolution of demodicosis as clinical disease takes different aspects, from dry to festering, from a manifestation of generalized or localized to one particular. According to current research, symptoms of demodicosis are constantly changing influenced by various favourable factors, an aspect that creates confusion in clinical approach and thus prevent correct diagnosis. In this context, the aim of the study was to bring current information on clinical diagnosis in canine demodicosis. The study was performed from September 2011 to December 2014, on a total of 187 dogs diagnosed with demodicosis microscopically. Clinical signs followed in this study were: erythema ("demodectic spots"), hair loss ("demodectic glasses"), follicular keratosis, hyperpigmentation, hyperseborrhea, pruritus. We also followed the evolution of the disease forms: dry demodicosis with nummular forms (circinate) and diffuse alopecia, pododemodicosis, pododemodicosis and otodemodicosis. The results revealed the absence of typical lesions: "demodectic glasses", "demodectic spots", occurrence of hyperpigmentation and itching in dogs with dry demodicosis (untypical for this form of clinical evolution and appearance of itching, generalized erythema and alopecia as a single clinical signs evolving. Specific localizations (pododemodicosis and otodemodicosis) were diagnosed without combination with other pathogens and clinical manifestations common to several pathogenic entities (itching, ihor smell, collections ear like "coffee grounds", blistering interdigital). The results contribute to the complex diagnosis of one of the most common and important diseases of parasitic nature of the dog.*

**Key words:** canine demodicosis, clinical diagnosis, particularities.

### INTRODUCTION

Dermatology has the advantage of exploring a visible organ, whose lesions are accessible to clinical examination. This apparent feature is minimized by the lack of specific cutaneous semiology. Thus, various skin disorders may have similar lesions, or, conversely, a dermatosis may have different clinical manifestations from one species to another, from one individual to another or from one moment to another (Radbea, 2005).

Canine demodicosis as a serious skin disease, takes different aspects: from a dry one to

another festering, from a local manifestation to a generalized, even specific type.

Clinical examination which is an essential step in diagnosis, includes both a general and a dermatological examination. This involves examining all body areas, not only that one which justifies consultation or the knowledge of elementary lesions (primary and secondary) and the setting of lesion extent. In recent years, the symptoms of demodicosis are continuously changing due to various influential factors which create confusion in clinical approach and thus prevent correct diagnosis (Gortel, 2006).

In this context, the aim of the study was to bring current information on clinical diagnosis in canine demodicosis.

## MATERIALS AND METHODS

The study was performed from September 2011 to December 2014 on a total of 187 dogs diagnosed with parasitism with *Demodex sp.* at the Parasitology Clinic of the Faculty of Veterinary Medicine Timișoara (Fig.1, 2).

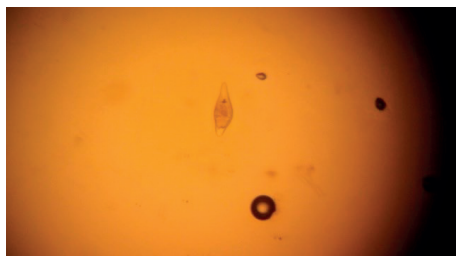


Fig.1. *Demodex spp.* egg



Fig.2. *Demodex spp.* adult

The sheet of clinical diagnosis aimed to:

- identify macroscopic skin lesions: erythema ("predemodectic spots"), hair loss ("demodectic glasses"), keratosis disorders, hyperpigmentation, hyperseborrhea, pruritus;
- identify forms of clinical course (dry demodicosis, pododemodicosis, otodemodicosis).

## RESULTS AND DISCUSSIONS

Following the clinical examination of 187 dogs microscopically diagnosed with demodicosis, we identified the following lesions:

- erythema, the primary lesion in demodicosis, was observed in the form of

large areas, generalized in 59 dogs (31.55%); regular characteristic spots ("predemodectic spots") were present only at 3 dogs (1.6%);

- alopecia was noted in well-defined areas, located on the body of 11 dogs (5.88%) and generalized alopecia areas appeared in 143 dogs (76.47%); characteristic lesions around the eyes ("demodectic glasses") were not present in any dog;
- keratosis disorders were seen as fine scales at 8 patients (4.27%); as a real layer of desquamated cells in 86 dogs (45.98%) and as large scales in 42 dogs (22.45%);
- hyperpigmentation was observed in 127 dogs (67.91%);
- hyperseborrhea was observed in 51 dogs (27.27%);
- superficial and deep pustules were found in 51 dogs (27.27%);
- pruritus was noted in 111 dogs (59.35%).
- crusts, ulcers, erosions, crevices, abscesses, phlegmons were found on the body of 9 dogs (4.81%);
- erythema, blistering, crevices, fistulas located podal were present in 32 dogs (17.11%).

The identification and distribution of skin lesions have helped us in establishing forms of clinical evolution of demodicosis in 187 dogs included in the study:

- localized demodicosis (LD) - 11 dogs, 5.88%;
- generalized demodicosis (GD) - 92 dogs, 49.19%;
- pododemodicosis (PD) - 51 dogs, 27.27%;
- otodemodicosis (OT) - one dog, 0.53%.

Localized demodicosis (LD) was diagnosed in dogs with primary clinical signs as: erythema - "predemodectic spots" (3/11 dogs), alopecia well defined areas (11/11 dogs), fine and white scales (8/11 dogs), pruritus (5/11) (Fig. 3).

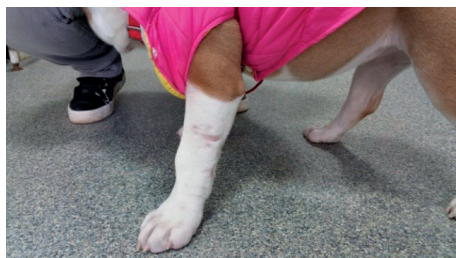


Fig. 3. Localized demodicosis

Generalized demodicosis (GD) was diagnosed in dogs with: diffuse and generalized alopecia (92/92 dogs), erythema (59/92 dogs), hyperkeratosis (86/92 dogs), hyperpigmentation (78/92 dogs), pruritus (55/92 dogs) (Fig. 4).



Fig. 4. Generalized demodicosis

Pododemodicosis (PD) was diagnosed in patients with: generalized alopecia (51/51 dogs), pustules (51/51 dogs), hyperpigmentation (49/51 dogs), hyperseborrhea (51/51 dogs), hyperkeratosis (42/51 dogs), pruritus (51/51 dogs), crusts, ulcers, erosions, crevices, abscesses, phlegmons (9/51 dogs) (Fig. 5).



Fig. 5. Pododemodicosis

Pododemodicosis (PO) was diagnosed as unique localization of lesions in dogs with demodicosis in interdigital spaces erythema, pustules, fistula, crusts (32/32 dogs). Podal lesions were not associated with lesions on the body (Fig. 6).



Fig. 6. Pododemodicosis

Otodemodicosis (OT) was diagnosed in a dog with itching and ear lesions: erythema, ear secretions like "coffee grounds".

Primary and secondary symptoms that characterize demodicosis are described in numerous bibliographical papers (Chabra et al, 2000; Mahato et al, 2005; Radbea, 2005; Beyazit et al, 2010; Mederle et al. 2010).

Receptivity of dogs to demodicosis and clinical progression of the disease is influenced by numerous factors including: genetic defect, alteration of skin's structure and biochemistry, immunological disorders, hormonal status, breed, age, nutritional status, oxidative stress, length of hair coat, stage of oestrus cycle, parturition, endoparasitism and debilitating diseases (Singh and Dimri, 2014). It is known that a genetic predisposition for developing canine juvenile generalized demodicosis exists; however, the primary defect leading to the disease remains unknown (Ferrer et al, 2014).

Erythema is considered the earliest symptom, forming so-called characteristic "predemodectic spots" (Radbea, 2005; Gortel, 2006). In the present study, we identified "predemodectic spots" on a very small number of dogs (3/187; 1.6%).

Alopecia, described as major clinical sign manifested in all clinical forms, was identified in all dogs with LD (11/187), with

GD (92/187) and PD (51/187); characteristic lesions around the eyes ("demodectic glasses") were absent.

Itching, present in PD and absent in dry demodicosis, was identified in 111/187 dogs diagnosed with LD (5/11), GD (55/92) and PD (51/51). Hyperpigmentation is reported in some dogs as a result of an accumulation of skin reactions in pododemodicosis (Mederle et al., 2010). In this study, pruritus and hyperpigmentation were identified as clinical signs of dry demodicosis, atypical for this form of evolution.

The descriptions of the clinical evolution of bibliographic information revealed a great variability of clinical expression of canine demodicosis.

Scott et al. (1995) describe the localized demodicosis as an onset, benign form, consisting of one or two lesions, alopecia and erythema, frequently in the face area; the generalized demodicosis requires the presence of at least five localized lesions.

In this study we diagnosed demodicosis in all clinical manifestations: dry (localized and generalized), suppurative and specific (pododemodicosis and otodemodicosis as single disease). Generalized demodicosis (DL) presented the highest prevalence (Fig. 1-6).

Pododemodicosis is frequently cited as a chronic pyoderma, while otodemodicosis is not indicated as a single disease (Radbea, 2005; Mederle et al., 2010). Pododemodicosis, not in combination with skin lesions, is diagnosed by some authors as an uncommon occurrence, and when they occur, particularly affect young dogs (Scott et al, 1995; Mederle et al, 2010).

The 32 cases (32/187) of pododemodicosis in our study affected dogs aged 3-7 years; some dogs which showed skin and podal lesions might have been younger. These spontaneously healed or mistreated lesions relapsed later in the interdigital spaces where healing was delayed, and the treatment was more difficult to apply.

Milosevic et al (2013) describe a case of otitis in dogs Beagle produced by species *D. injai*. In the present study only one dog (1/187) was diagnosed with otitis demodicosis form as the only clinical manifestation.

## CONCLUSIONS

► We diagnosed demodicosis in 187 dogs in all clinical manifestations: localized demodicosis (LD), generalized demodicosis (GD), pododemodicosis (PD), pododemodicosis (PO) and otodemodicosis (OT).

► The highest prevalence showed a generalized demodicosis (49.19%), followed by pododemodicosis (27.27%) and localized demodicosis (5.88%).

► We diagnosed pododemodicosis and otodemodicosis as unique manifestations in percentage of 17.11, respectively, 0.53.

► A new approach to clinical diagnosis in canine demodicosis is supported by the clinical versatility which consists of: the absence of the characteristic "demodectic glasses" lesions, the identification of an insignificant percentage of "predemodectic spots" (1.6%), pruritus and hyperpigmentation in dry demodicosis (LD and GD), the presence of atypical clinical signs of demodicosis, common to other pathogenic entities.

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