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Canine ehrlichiosis associated to demodectic mange in a domestic dog: clinical case report

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Abstract. Canine demodicosis is a skin disease caused by excessive proliferation of *Demodex* spp. genetic, immunological, parasitic and bacteriological factors have been attributed to its presentation. Canine ehrlichiosis is a disease caused by intracellular rickettsia of the genus *Ehrlichia* spp., which is transmitted by the tick *Rhipicephalus sanguineus*. A male dog, Doberman breed, with 3 years old, with multiple cutaneous lesions with intense pruritus was brought consultation medical. The complete blood count (CBC) showed anemia, eosinophilia and marked thrombocytopenia. Abundant mites morphologically compatible with *Demodex* spp. were observed in a deep skin scraping. In addition, in immunochromatographic test for *Ehrlichia canis*, was observed a positive result. With these findings observed in the clinical and laboratory diagnosis, demodectic mange associated with canine ehrlichiosis was determined.

Keywords dog, *Demodex*, *Ehrlichia*, diagnostic

Erliquiose canina associada à Demodicose em cão doméstico: relato de caso clínico

Resumo. A demodicose canina é uma doença de pele causada pela proliferação excessiva de *Demodex* spp. fatores genéticos, imunológicos, parasitários e bacteriológicos foram atribuídos à sua apresentação. A erliquiose canina é uma doença causada por rickettsia intracelular do gênero *Ehrlichia* spp., transmitida pelo carrapato *Rhipicephalus sanguineus*. Um cão do sexo masculino, raça doberman, com 3 anos de idade, com múltiplas lesões cutâneas com prurido intenso foi levado à consulta médica. O hemograma completo (CBC) mostrava anemia, eosinofilia e trombocitopenia acentuada. Ácaros de Abundan morfologicamente compatíveis com *Demodex* spp. foram observados em uma raspagem profunda da pele. Além disso, no teste imunocromatográfico para *Ehrlichia canis*, foi observado resultado positivo. Com esses achados observados no diagnóstico clínico e laboratorial, foi determinada a sarna demodélica associada à erliquiose canina.

Palavras chave: cão, *Demodex*, *Ehrlichia*, diagnóstico

Ehrlichiosis canina asociada con sarna demodéctica en un perro doméstico: informe de un caso clínico

Resumen. La demodicosis canina es una enfermedad de la piel causada por la proliferación excesiva de *Demodex* spp. Se han atribuido factores genéticos, inmunológicos, parasitarios y bacteriológicos a su presentación. La ehrlichiosis canina es una enfermedad causada por la rickettsia intracelular del género *Ehrlichia* spp., que se transmite por la garrapata *Rhipicephalus sanguineus*. Un perro macho, raza Doberman, con 3 años de edad, con

múltiples lesiones cutáneas con prurito intenso fue llevado a consulta médica. El conteo sanguíneo completo (CBC) mostró anemia, eosinofilia y trombocitopenia marcada. Se observaron en un raspado profundo de la piel ácaros abundantes morfológicamente compatibles con *Demodex* spp. Además, en la prueba inmunocromatográfica para *Ehrlichia canis*, se observó un resultado positivo. Con estos hallazgos observados en el diagnóstico clínico y de laboratorio, se determinó la sarna demodéctica asociada con la ehrlichiosis canina.

Palabras clave: perro, *Demodex*, *Ehrlichia*, diagnóstico

Introduction

Demodicosis is a disease caused by excessive proliferation of *Demodex* spp. mites (Plant et al., 2011). This parasite does not cause skin disorders under normal condition (Tsai et al., 2011). On the other hand, Canine ehrlichiosis is a disease caused by an obligate intracellular rickettsia of the genus *Ehrlichia*, which is transmitted by the dog's brown tick *Rhipicephalus sanguineus* (Greene & Vandevelde, 2015). Different authors have reported the association of *Demodex* spp. and *Ehrlichia* spp. with other infectious agents in skin disorders in dogs (Collett, 1987; Martins et al., 2008; Matos et al., 2012; Nobre et al., 1998; Tarallo et al., 2009). The aim of the present investigation is to report a patient with demodectic mange associated to canine ehrlichiosis, clinical findings, diagnosis and pharmacological treatment.

Case report

A male dog, Doberman breed, with 3 years old, was brought to medical consultation to UNIPAZ Veterinary Clinic. The owner manifests the presence of skin injuries in the face, with severe pruritus. Clinical examination shows multiple lesions in the facial area, compromising periocular and perioral regions and around and inside ear, with bilateral asymmetric alopecia, epidermal collarettes, erythema, scabs (Figure 1) and intense pruritus. In addition, adenitis is appreciated.



Figure 1. Clinical examination shows multiple lesions in the facial area.

A complete blood count (CBC), a deep skin scraping and peripheral blood smear examination were carried out.

Results

In the CBC a decrease in the hematocrit (25.2%) and hemoglobin (7.5g/dl), marked thrombocytopenia and eosinophilia were observed. All remaining values were within the limits of the reference range. Due to the marked thrombocytopenia reported, Anigen (Anigen rapid *E. canis*/Anaplasma Ab Test Kit BIONOTE®) was performed, resulting positive for *E. canis*. Abundant mites were observed in deep skin scrapings, morphologically compatible with *Demodex* spp. (Figure 2), blood smear showed morulae structures compatible with *Ehrlichia* spp. (Figure 3) as reported in other studies (Aguilar et al., 2019; Veena et al., 2017).



Figure 2. Abundant *Demodex* mites in deep skin scraping. (Magnification 40x and 10x).

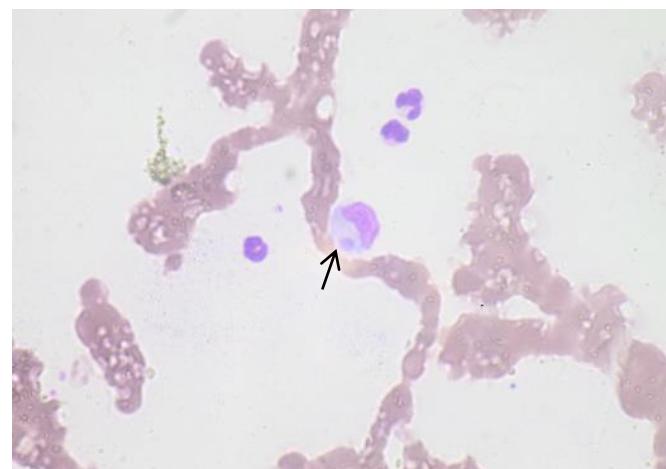


Figure 3. Hemacolor staining. Blood smear showed morulae structures compatible with *Ehrlichia* spp. in mononuclear cell (arrow).

Obtained the results of the diagnostic tests used and clinical findings, the patient was established with the following medications. Ivermectin oral tablets at the doses 600 ug per kg, daily for a week (ivermectina® Laboratorios Calox Bogotá Colombia). Bath with Amitraz (Amitraz® 3% Agroquímicos Colombia S.A. Agroz S.A.), chlorhexidine (Baxidin Spray®, Basic Farm laboratories S.A.; Bogotá-Colombia) and Benzoyl peroxide (Peroxidex® Virbac Colombia LTDA) every 5 days for two months. Oral doxycycline (Descensor- Vet® Compañía California S.A Bogotá Colombia), at the dose of 5 mg per kg, twice daily for 28 days, and single dose of 5 mg per kg of Imidocarb dipropionate (Imizol® MSD Salud Animal Merck & Co INC), subcutaneously, repeated in 15 days. Supportive therapy consisting in multivitamin complexes and immunostimulants were applied. The multivitamin complexes (Glicopan pet® Laboratorios VETNIL LTDA Brasil) supplied daily, orally. As hepatoprotective, fluid extract of Cynara (Canatox® Laboratorio BASIC FARM S.A. Bogotá - Colombia) was supplied twice a day, orally, for two months. An immunostimulants 2 mL per 10 kg intravenously, repeated in 48 hours (INFERVAC® Laboratorios Calier de los Andes S. A. Bogotá - Colombia). Concluded this treatment a clinical improvement of the patient was observed.

Discussion

Skin diseases are still considered one of the main reasons for veterinary medical consultation. Carry out a complementary clinical exam, becomes a fundamental measure for the establishment of a correct diagnosis and treatment, since several infectious agents are usually involved in the skin disorders (Pereira et al., 2005). In the present clinical case, the complementary clinical examinations allowed observe important clinical findings, such as demodectic mange associated to canine ehrlichiosis, for establishing adequate treatment for the patient. It was very important to have applied treatment for both diseases in this patient.

Demodicosis in young animals, has a reduced extent, often heals spontaneously without treatment (Scott et al., 2001), while this has not been described in the adult form (Medleau et al., 2003). Treatment

with ivermectin orally, baths with amitraz, and shampoo based on benzoyl peroxide, also, doxycycline and imidocarb dipropionate applied to the patient in this clinical case is consistent with the reported (Ghubash, 2006; Sainz et al., 2000). The application of ivermectin plus supportive therapy in the treatment was effective against demodectic mange associated to canine ehrlichiosis.

Different authors have reported the association of *Demodex* spp. and *Ehrlichia* spp. with other infectious agents in skin disorders in dog. It was reported in dogs the association between *Cryptococcus* spp., *Ehrlichia* spp. and *Demodex* spp. (Collett et al., 1987). Other studies investigated the coexistence of demodicosis associated with *Malassezia pachydermatis* (Nobre et al., 1998; Tarallo et al., 2009). It was found *Demodex canis*, *Sporothrix schenckii* and bacteria of the genus *Staphylococcus* and *Streptococcus*, a clinical case of multifactorial dermatitis in a dog (Matos et al., 2012). Also was reported a cutaneous cryptococcosis associated with severe infestation with *Sarcoptes* spp. and *Demodex* spp. (Martins et al., 2008). A moderate cutaneous myiasis and bacterial infection associated with Ehrlichiosis was reported in a dog (Davoust, 1993) and as has been observed in present case, *Demodex* spp associated to *Ehrlichia canis*. Also, demodectic mange in adult dogs occurs secondary to immunosuppressive conditions such as neoplasms (Duarte et al., 2014; Scott et al., 2001), hyperadrenocorticism, hypothyroidism, prolonged corticosteroid treatments (Scott et al., 2001). The clinical sign observed in this patient, the cutaneous disorders and hematological results such as anemia and thrombocytopenia, are consistent with other authors for demodicosis and canine ehrlichiosis (Kwochka, 1994; Sainz et al., 2000).

The breed of the dog is a factor to consider in the diagnosis of demodicosis. Was reported a relationship between demodectic mange with the Staffordshire, Doberman and Boxer breeds (Flores et al., 2006), what is consistent with the breed involved in this case report. Therefore, it can suggest a possible susceptibility by breed, among other factors. However, has been reported that the *Demodex* spp. is present in the skin of all dogs, independently of age, sex, breed or coat (Ferreira et al., 2015; Ravera et al., 2013).

Conclusion

The present study reports for the first time demodectic mange associated to canine ehrlichiosis in a domestic dog in Colombia.

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