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Research Article

Case report: Demodicosis in a Chow-chow dog at Yours Veterinary Clinic in Padang Panjang City

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ABSTRACT

Demodecosis, also known as Red Mange, Acarus Mange, and Follicular Mange, is a skin disease caused by the mite Demodex canis. Demodecosis infection can occur in dogs of all ages. This study aims to diagnose and treat the infection of Demodex sp in chow-chow dogs. Clinical signs include generalized alopecia, scales, and crusts found on the body's surface, followed by dehydration symptoms, poor skin turgor, and long CRT. Supporting examinations to determine demodecosis infection are carried out using the deep skin scrapping test method. Next, a hematological exam was carried out. The hematology examination interpreted the blood analysis results to indicate that the dog had normochromic microcytic anemia. A decrease in RBC, hemoglobin, and hematocrit indicates anemia. A low MCV indicates Microcytic, and normochromic is due to a normal MCHC. Treatment is carried out by administering ivermectin, diphenhydramine HCl, and longamox.

Keywords: *Chow-chow, Deep skin scraping test, Demodecosis, Demodex canis*

Introduction

The value dogs have as pets for humans makes it necessary to pay attention to their maintenance (1). However, over time, more and more people have dogs as their pets, so some of the external diseases found in dogs can be transmitted to their owners. One of them is a skin disease (2).

Of the various external skin diseases in dogs, one of the most commonly found is demodecosis. Demodecosis, also known as Red Mange, Acarus Mange, and Follicular Mange, is a skin disease caused by Demodex canis mites (3).

According to Izdebska et al. 2009 Demodex sp. has three genera, including D. canis, D. injai, and D. cornei. Hair follicles, glands, and sebaceous ducts are the predilection areas of D. canis and D. injai. Whereas D. cornei can be found in the superficial layer of the stratum corneum

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throughout the epidermis, Demodex sp. can infect dogs, starting with 3-day-old puppies (4). Demodex sp suppresses the immune system while developing into more (5). Demodex sp. infection causes lesions on the entire body surface with redness that causes an itch reflex, so dogs feel uncomfortable and scratch to cause new wounds (6). Wiryana's research in 2014 found that 8% of 401 dogs with dermatitis were caused by Demodex sp (7). Therefore, it is necessary to immediately provide appropriate treatment and treatment to animals suffering from demodicosis

Materials and Methods

The tools used in this study were a microscope, a hematology analyzer, scalpel No. 10, an object and cover glass, and a 1 ml and 3 ml syringe. The materials used were emersion oil, Ivermectin (Ivomec Super 1% inj® PT Romindo Primavetcom, Jakarta, Indonesia), Diphenhydramine HCL (Vetadryl inj®, PT Sanbe Farma, Bandung, Indonesia), and Longamox (Longamox 150 mg/100 ml inj® Vetoquinol, Polska, France).

This research was conducted at Yours Animal Clinic in Padang Panjang City. Date: September 1–9, 2023.

- *Deep Skin Scrapping test*

Examination of skin scrapings using the deep skin scrapping test method. This method uses a scalpel as a tool for collecting skin scrapings. The skin is massaged using the fingers ten times, and then the sample is collected until the skin bleeds. The sample is placed on an object glass, and emersion oil is given to be dripped on the sample (Figure 2.A). The sample is flattened, covered with a cover glass, and observed under a microscope with 100x and 400x magnification (8). Microscopic examination of deep skin scraping revealed the presence of adult-stage Demodex sp. mites.

Result and Discussion

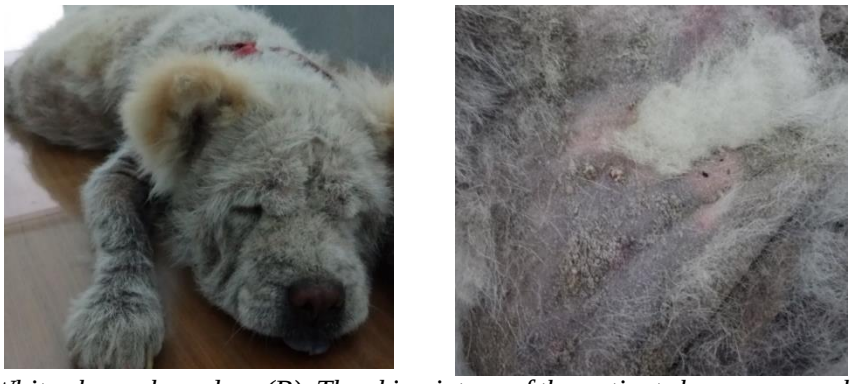

Figure 1. (A) White chow-chow dog; (B). The skin picture of the patient shows severe alopecia, hairloss, crusts, pruritus (itchy response) on the balding area, and very poor skin turgor.

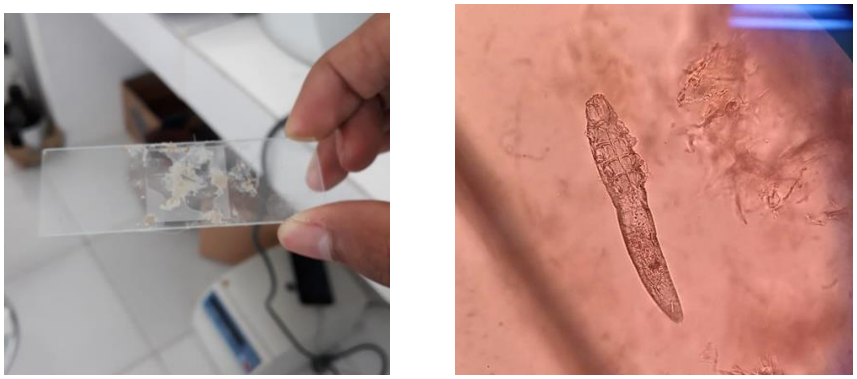

Figure 2. (A) Scraping sample with the skin scrapping test method; (B) Microscopic examination results of Demodex sp. using 100 times magnification

Case Report

a. Sinyalemen and Anamnesa

A dog named White with a chow-chow breed, male, 11 years old, with a white coat color, was examined at Yours Animal Clinic Padang Panjang City with complaints of severe alopecia (baldness), scabs almost all over the body surface, poor skin turgor, and inactive movement.

b. Physical Examination

White's present status (Figure 1.A) was as follows: weight 14 kg, red-whitish oral mucosa, capillary refill time (CRT) >3 seconds, heart rate 80 x/min, respiratory frequency 25 x/min, body temperature 38.5°C, and body condition score 3. The patient had severe alopecia, hair loss, crusts, pruritus (itchy response) on the balding area, and very poor skin turgor (Figure 1B). Furthermore, skin scrapings were examined using the Deep Skin Scrapping test to identify ectoparasite investment in the alopecia area.

The morphology of Demodex sp. is shaped like a carrot or cigar, with four pairs of short legs (Figure 2.B).

- *Hematology Screening*

Table 1. Hematology Screening Results

Parameters	Normal	Results
WBC	6..0 - 17.0 x 10^9/l	11.3 x 10^9/l
Limfosit	0.9 - 5.0 x 10^9/l	4.0 x 10^9/l
Monosit	0.3 – 1.5 x 10^9/l	1.9 x 10^9/l (H)
Granulosit	3.5 – 12.0 x 10^9/l	5.4 x 10^9/l
RBC	5.5 – 8.5 x 10^{12}/l	4.94 x 10^{12}/l (L)
Hemoglobin	12.0 – 18.0 g/dl	9.7 g/dl (L)
Hematokrit	37.0 – 55.0 %	28.4 % (L)
MCV	60.0 – 72.0 fl	57.5 fl (L)
MCHC	32.0 – 38.5 g/dl	34.2 g/dl
PLT	200 – 500 x 10^9/l	208 x 10^9/l
PDW%	12-18 fl	14.4 fl

Description = WBC (White Blood Cell, RBC (Red Blood Cell), MCV (Mean Corpuscular Volume), PLT (Platelet), MCHC (Mean Corpuscular Haemoglobin Contentration), L: Low, H: High. Normal hematologic values in dogs (Weiss and Wardrop, 2010)

c. Supporting Examination

A hematology examination is required to determine the interpretation of blood in patients. The examination was conducted at the West Sumatra Provincial Animal Hospital (RSHP). The hematologic examination interpreted the blood analysis results, which showed that the white dog had normochromic microcytic anemia. A decrease in RBC, hemoglobin, and hematocrit indicates anemia. The presence of low MCV indicates microcytic and normochromic due to normal MCHC (Table 1). These results align with the clinical symptoms, as shown by dehydration, poor skin turgor, and prolonged CRT.

Diagnosis and Prognosis

Based on history, physical examination, clinical symptoms, a deep skin scraping test, and hematology, The prognosis for Demodex sp. cases in white patients (chow-chow dogs) is fausta or curable with proper and routine treatment.

Treatment

Ivermectin (Ivomec Super 1% inj®, PT. Romindo Primavetcom, Jakarta, Indonesia) at a dose of 0.02 mL/kg BW subcutaneously. Administration was done once every seven days. Furthermore, the patient was given Diphenhydramine HCL (Vetadryl inj®, PT Sanbe Farma,

Bandung, Indonesia) at a dose of 0.1 mg/kg BW combined with the administration of Longamox (Longamox 150 mg/100 ml inj® Vetoquinol, Polska, France) at a dose of mL/kg. Those administrations were given three times a week.

Discussion

The patient had severe alopecia, hair loss, crusts, pruritus (itchy response) on the balding area, and very poor skin turgor. Dogs infected with Demodex sp. scratch constantly, causing crusts (9). Lesions caused by scratching will lead to secondary infections. Infection of the hair follicles can cause abscesses, resulting in the formation of necrotic tissue. According to Ibler and Kromann (2014), secondary infections are usually caused by Staphylococcus aureus bacteria (10). Lesions are generally found on the abdomen, chest, legs, ears, and elbows of the mite's favorite habitat. The disease quickly spreads throughout the body. Affected animals show symptoms of severe itching, inflammation, erythema of the skin, and even crust formation and keratinization (11).

Hyperpigmentation is a change in skin color to darker if the area is hairless, caused by increased melanocyte activity in both the epidermis and dermis. There are also papule lesions that are included in the primary skin lesions. Papules are the result of an infection in the skin. Pustules on the skin are also found, although not in large numbers. Pustules are skin lesions that are relatively larger than papules and have pus exudate (12).

The life cycle of Demodex sp. lasts on the host's body for 20–35 days, consisting of eggs, larvae, nymphs, and adult stages in hair follicles and sweat glands. Male mites will spread on the skin surface, while female mites will lay their eggs in hair follicles. In the follicle, the male mite will mate with the female. Then the egg will hatch into a six-legged larva within 1–5 days. It will develop into an 8-legged nymph, after which it becomes an adult. The time required from egg to adult is 11–16 days (1).

The incidence of demodecosis infection can occur in dogs of all ages. Research by Wiarsa (2012) amounted to 46 dogs, consisting of 35 purebred dogs and 11 local dogs (13), found that dogs with ages less than one year to 11 years were positive for demodecosis after a laboratory examination found Demodex canis (14). A skin scraping test is one of the dermatology diagnostic techniques for scraping the skin. This test is simple, inexpensive, and relatively fast in determining the type of ectoparasites that infect animals. The skin scrapping technique is divided into superficial and deep skin scrapping (15).

Common differential diagnoses are pyoderma and dermatophytosis. Based on the severity of the secondary infection, the animal may also be in poor condition or have systemic disease. Monitoring of therapeutic response is based on routine scraping examinations, usually monthly, recording the findings of the scraping examination under low magnification, either the life stages of the mites, their number, or their survival. The number found should decrease each month. If not, re-evaluate the treatment.

Conclusion

Based on a series of diagnoses related to the diagnostic procedure, the chow-chow dog named White was tested positive for demodicosis with a prognosis of fausta, which is caused by Demodex sp. mites that live in hair follicles and sebaceous glands.

Implications

Examining skin scrapings based on each lesion location in demodecosis cases is necessary. Before carrying out therapy, it is hoped that there will be the mapping of existing lesions in the case animal to see changes in the lesions after therapy. After the case animal recovers, it is hoped that further laboratory tests will be carried out to ensure that the animal has truly recovered from demodicosis.

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