



Case Report: Canine Ehrlichiosis in a German Shepherd Dog (GSD): A Clinical and Laboratory Diagnosis

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Abstract:

Canine Ehrlichiosis is a tick-borne disease caused by Ehrlichia canis, affecting dogs worldwide. This case report presents a confirmed case of Ehrlichiosis in a 2-year-old male German Shepherd Dog (GSD) with a history of tick infestation. The clinical presentation, diagnostic approach, treatment, and recovery progression were as detailed. The dog exhibited epistaxis, fever, emaciation, and reluctance to walk. The diagnosis was confirmed through a rapid test kit and microscopic examination of Giemsa-stained blood smears. Treatment with doxycycline, diaminazine aceturate, piroxicam, fluid therapy, and vitamin K1 led to a full recovery within 21 days. This report aims to highlight the importance of early diagnosis and effective treatment in managing Ehrlichiosis in canines.

Keywords: Canine Monocytic Ehrlichiosis, Public health threat, Epistaxis, Vitamin K1, Fluid therapy

1.0 INTRODUCTION

Canine Monocytic Ehrlichiosis (CME) is a global tick-borne infection resulting from *Ehrlichia canis*, an obligate intracellular bacterium with the major target of infection being monocytes and macrophages of dogs. The brown dog tick, *Rhipicephalus sanguineus*, is the principal vector spreading the pathogen through trans-stadial transmission by blood feeding [1]. Apart from tick bites, *E. canis* can be transmitted by blood transfusions and, less commonly, vertical transmission from mother to offspring [2]. CME progresses through three clinical phases: acute, subclinical, and chronic. The acute phase typically develops 1–3 weeks post-infection and is characterized by fever, lethargy, lymphadenopathy, and thrombocytopenia [3]. During the subclinical phase, dogs may be clinically normal, although the organism persists in the spleen and other tissues. If not treated, the infection can progress to the chronic phase, leading to severe clinical signs that include anaemia, bleeding disorders, weight loss, and even death.

While CME can infect dogs of any age and breed, certain breeds such as German Shepherds and Siberian Huskies have shown increased susceptibility to more severe disease expression. Dogs older than one year are more frequently affected, but infection has been reported in dogs as young as three months [4].

More recent reports have focused on the zoonotic potential of *E. canis*. Though infections in humans are rare, infections have occurred, demonstrating that *E. canis* can indeed infect humans, particularly those with direct contact with infected dogs or ticks [5]. This points to the applicability of a One Health approach in the control of CME due to the interconnected health of humans, animals, and the environment [1]. This case report documents the diagnostic course and successful treatment of a confirmed case of CME in a German Shepherd Dog and illustrates the importance of early detection and treatment in the management of this potentially life-threatening disease.

2.0 Case Presentation: Signalment and History: A 3-year-old German Shepherd Dog (GSD) weighing 18 kg was presented with a history of inappetence, emaciation, and staggering gait. The dog was also reported to have been given a dose of ivermectin injection, 1 month ago due to tick infestation.

2.1 Clinical Examination: Temperature of 40.3°C, epistaxis presenting active nasal bleeding, emaciation and unwillingness to walk, generalized weakness and loss of stamina with heavy tick infestation.

2.2 Differential Diagnoses: Trauma-induced nasal bleeding, Ehrlichiosis, Babesiosis, Anaplasmosis.

3.0 Results

3.1 Diagnostic Approach

Diagnosis of Canine Monocytic Ehrlichiosis (CME) was approached by both serological and microscopic methods to determine the presence of *Ehrlichia canis*.

3.2 Rapid Antibody Test for *Ehrlichia canis*

PetCare One-Step Rapid Test Kit was employed for the qualitative detection of dog whole blood, serum, or plasma for *E. canis* antibody. It is a highly sensitive and specific chromatographic immunoassay for anti-*E. canis* antibodies.

3.2.1 Principle: Two visible lines on the test device are labelled “T” (Test line) and “C” (Control line). *E. canis* antibodies in the sample result in a colored (reddish-purple or purple) test line in addition to the control line.

3.2.2 Procedure: Three drops of whole blood were placed in the sample well of the device. The result was recorded and interpreted after 15 minutes.

3.2.3 Interpretation: Two bands, one at “C” and the other at “T,” are a positive test, indicating the presence of *E. canis* antibodies. It is a sign of exposure or current infection. In this case, distinct reddish-purple lines were observed at both “C” and “T,” indicating a positive test.

3.3 Microscopy and Giemsa-Stained Blood

Smear

3.3.1 Microscopy of blood smears was conducted to observe *Ehrlichia* morulae within white blood cells:

3.3.2 Sample Preparation: EDTA-anticoagulated blood was used for the preparation of a thin blood smear on a clean glass slide. The smear was fixed in absolute methanol (3 dips), air-dried for 30 seconds, and stained with 5% Giemsa solution for 20 minutes. The slide was washed with tap water after staining and left to air dry.

3.3.3 Microscopic Examination: Morulae (intracytoplasmic inclusions of *E. canis*) in mononuclear cells were observed under oil immersion microscopy, typical of acute CME infection.

3.4 Confirming Diagnosis and Hematologic Results

3.4.1 Packed Cell Volume (PCV): PCV was 18%, indicating anaemia, a common haematologic finding in CME.

3.5 Confirmatory Diagnosis: Diagnosis was confirmed based on:

- Positive rapid antibody test (visible bands at both “C” and “T” lines),
- Identification of morulae in white blood cells under microscopy,
- Clinical signs and haematology findings consistent with Ehrlichiosis.



Plate 1: Showing morulae of *E. canis* in blood smear stained with Giemsa



Plate 2: Rapid test kit for detection of *E. canis* antibody

4.0 Management Procedure

Targeted therapeutic regimen treatment was initiated. Treatment protocol was Diaminazine acetate 7

mg/kg, intramuscularly, with a repeat two weeks later. Although Diaminazine is used regularly to treat protozoal infections, in this instance, it was administered to address any possible concurrent haemoparasitic infections. To correct the thrombocytopenia and coagulopathy observed in Ehrlichiosis infections, Vitamin K1 treatment was initiated at 18 mg subcutaneously, every 12 hours for the first 24 hours, and followed by 9 mg subcutaneously once daily for three days. Antibiotic treatment was the most important in eliminating *Ehrlichia canis*. The dog was placed on Doxycycline 8 mg/kg orally once a day for 14 days, being the drug of choice in treating CME because it has very good intracellular penetration. Piroxicam 0.3 mg/kg (0.015 ml/kg) IV stat and multivitamin 0.1 ml/kg IM stat were also administered. Supportive treatment was given during treatment with IV Ringer lactate fluid, and the dog was under strict observation for clinical recovery and possible adverse drug reactions. This combination therapy was found to have facilitated remarkable clinical recovery, with improved appetite, weight gain, and return of normal activity levels which were observed on case follow-up.

4.1 Treatment Response

Day 3: Epistaxis ceased, and temperature normalized.

Day 7: Appreciable improvement was observed in appetite, endurance, and general condition.

Day 21: The dog made a complete recovery and regained normal activity levels.

5.0 Discussion

A severe fever of 40.3°C (104.5 °F) for an extended duration was the most notable clinical indication observed in this case, as illustrated in reports of past research on Canine Monocytic Ehrlichiosis (CME) (6). While dogs infected during the initial phase of CME may be of normal appetite at first, as in this case, early-onset anorexia and external bleeding indicated a more acute and symptomatic disease phase [7]. Packed Cell Volume (PCV) was markedly abnormal (18%), indicating anaemia. Although a complete hemogram was not conducted, the low PCV level alone confirmed the suspicion of bone

marrow suppression and anaemia characteristically associated with CME. Thrombocytopenia, not quantitated here but directly implicated by the presence of external bleeding, is a classical presentation owing to deranged platelet function and concentration level. The bleeding is likely, an expression of both the direct effect of *Ehrlichia canis* on the survival of platelets and indirect suppression of the activity of the bone marrow, leading to reduced platelet production and clotting ability. Serology via a rapid antibody detection kit yielded a clear and strong test line, which is indicative of high levels of circulating *E. canis*-specific antibodies. The finding is compatible with an active or ongoing infection [8]. The strong band visibility reflected that the dog's immune system had triggered a strong antibody production, and thus the rapid test was a good confirmatory test in this case. While delayed antibody response can be observed in some dogs, especially in early infection, this case appeared to have progressed long enough for a strong serological signal. Treatment using doxycycline at 8 mg/kg/day for 14 days was in line with recommended treatment protocols for CME [9]. The prolonged period of administration of the doxycycline capsule complemented with Diaminazine acetate was to ensure the complete elimination of the parasite and potential co-infections [10]. Other supportive treatments, including Vitamin K1 helped in the treatment of the abnormality in blood clotting as part of the overall management. External bleeding rendered the need for prompt and thorough treatment even more evident. This is in line with the treatment protocol outlined in earlier research by Kottadamane [11] in the Boxer breed of dog which recovered 21 days post-treatment. Thus, continuous monitoring, targeted and proper supportive treatments coupled with owner's compliance appear to be the critical requirements in the elimination of the infection from the blood in CME-infected dog. Piroxicam was administered for temperature control [12], and the dog's appetite was stimulated with the use of a multivitamin for immunity and hematopoiesis stimulation.

6.0 Conclusion: This case highlights the clinical presentation, diagnosis, and protocols for a successful treatment of canine Ehrlichiosis. Doxycycline therapy remains the gold standard, as it

can eliminate *Ehrlichia* organisms effectively. Supportive therapy using vitamin K1 was also critical in the management of epistaxis. The recovery of this dog reinforced the role of early diagnosis and treatment. Practicing veterinarians should suspect Ehrlichiosis in dogs that present with epistaxis and other systemic signs; early diagnosis and therapeutic intervention with appropriate drugs are critical for positive treatment outcomes.

7.0 Acknowledgment: The authors appreciate the pet owner's compliance and the veterinary team who participated in the diagnosis and case management.

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