

## Transmissible venereal tumor and anaplasmosis in a domestic dog<sup>†</sup>

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**ABSTRACT:** This paper reports a case of a transmissible venereal tumor and anaplasmosis in a domestic dog. A 2-year-old, 7.1 kg, black and white domestic female dog was presented to the clinic for examination after being rescued. Physical examination revealed *Rhipicephalus sanguinis* infestation and vaginal swelling with nodules approximately 5 mm in diameter. A complete blood count indicated leukocytosis, neutrophilia, and eosinophilia. Decreased hemoglobin, mean corpuscular hemoglobin concentration, and platelet values were observed. Blood biochemistry test results showed decreased total protein levels. Vaginal nodule cytology results were consistent with a transmissible venereal tumor. The dog was diagnosed with a transmissible venereal tumor and anaplasmosis. Treatment included doxycycline antibiotics, vincristine chemotherapy agents, fu fang herbal supplements, fluralaner anti-flea and tick medication, cazitel antihelmintics, Kalvidog supplements, and medicated shampoo for skin condition improvement.

### Keywords:

domestic dogs, anaplasmosis, transmissible venereal tumor, hematology, blood biochemistry,

### INTRODUCTION

Canine transmissible venereal tumors (CTVT) and anaplasmoses are significant health concerns with distinct mechanisms. CTVT is a neoplasm of the Canidae family affecting external genitalia, transmitted via sexual contact. Lesions manifest on the dorsal vaginal wall as cauliflower-like masses (Abeka 2019). CTVT predominantly affects dogs aged 2–6 years, without breed or sex predispositions (Chikweto *et al.* 2013). Canine anaplasmosis is a tick-transmitted disease affecting animals and humans, caused by intracellular gram-negative bacteria. *Anaplasma* sp., *A. platys* and *A. phagocytophilum* are frequently observed in dogs. *Rhipicephalus sanguinis* is the primary vector of *A. platys* (Atif *et al.* 2021). CTVT is prevalent in areas with high dog populations and unregulated mating, while anaplasmosis shows peak incidence in regions with high tick densities and seasonal exposure (Balmori-de la Puente *et al.* 2024). Anaplasmosis epidemiology in Indonesia has gained attention through case studies, highlighting its prevalence in dogs. This paper presents a case report of CTVT and anaplasmosis in a domestic dog.

### CASE

**Anamnesis and Signalements:** A 2-year-old domestic female dog, brown and white, named Spring, weighing 7.1 kg was rescued (Figure 1). The owner requested a general health examination. **Physical Examination:** Rectal temperature 37.5 °C, active, BCS 4/9, pulse rate 112 times/min, respiratory rate 24 times/min, skin turgor <3 s,

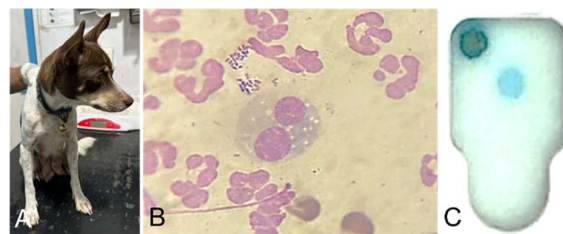


Figure 1. Spring dog and diagnostic test results. (A) Appearance of Spring dog, (B) vaginal cytology showing round cell tumor, and (C) positive anaplasmosis from IDEXX SNAP 4Dx plus test kit.

and pale oral mucosa. *Rhipicephalus sanguinis* found on the entire body surface. Hair loss. Vagina swollen, no bleeding, ± 5 mm nodules present. Vulva slightly swollen. **Supporting Examination:** Complete Blood Count (CBC), blood biochemistry, IDEXX SNAP 4Dx plus test kit detecting *Dirofilaria immitis* antigen and antibodies to *Borrelia burgdorferi*, *A. phagocytophilum*, *A. platys*, *Ehrlichia canis*, and *E. ewingii*, and vaginal cytology by vaginal smear. **Diagnosis:** Transmissible venereal tumor and ana-plasmosis. **Prognosis:** Fausta. **Therapy:** treatment for blood parasites, anemia, tumors, and bathing with sebazole medical shampoo.

### RESULTS AND DISCUSSION

CBC examination revealed leukocytosis, neutrophilia, and eosinophilia (Table S1). Hemoglobin, MCHC, and PLT

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values were below the normal range. Blood biochemistry revealed elevated total protein levels (Table S2). The SNAP 4Dx plus test was positive for anaplasmosis. Cytological analysis of the vaginal nodule demonstrated round cell tumors consistent with transmissible venereal tumor.

CBC examination revealed leukocytosis, neutrophilia, and eosinophilia. The WBC count increased due to elevated neutrophil and eosinophil levels. Neutrophils serve as the primary defense against infection and inflammation and play a role in the tumor response (Wu *et al.* 2020). Tumors can also elicit increased eosinophil counts in the blood (Guija-de-Arespacochaga *et al.* 2022). Results indicated decreased hemoglobin, MCHC, and platelets, suggesting Spring has anemia (Boonhoh *et al.* 2023), attributed to hematophagous tick infestation. Reduced platelet values are associated with blood-parasite infections targeting platelets, such as *Anaplasma sp.* (Tommasi *et al.* 2014). Blood chemistry examinations showed ALP, ALT, BUN, Creatinine, and Glucose within normal ranges, but elevated total protein values. According to Dyachenko *et al.* (2012), inflammation from *Anaplasma sp.* infection can increase protein production.

Spring was diagnosed with CTVT and anaplasmosis, requiring treatment. The regimen included Doxycycline (10 mg/kg BW orally) once daily for 30 days, Cazitel Plus (1 tab/10kgBW orally) once daily for 3 days, KalviDog Plus supplement (1 tablet/10 kgBW/day orally) for 30 days, and Fufang Ejiao Jiang (0.2 ml/kgBW orally) once daily for 15 days. Spring was bathed with a sebazolele medical shampoo to prevent secondary infection from tick bites. Bravecto L ¼ tablet (containing fluralaner) was administered. Chemotherapy involved Vincristine Inj (0.025 ml/kg IV) once a week for 4 weeks.

Tetracycline preparations are efficacious in anaplasmosis therapy; therefore, doxycycline was prescribed (Sainz *et al.* 2015). Doxycycline inhibits protein synthesis by interacting with the 30S ribosomal subunit (Allerton 2020). Cazitel was administered as a prophylactic and therapeutic agent against the endoparasites. KalviDog supplements were provided to maintain vitamin and mineral requirements and improve skin and coat condition. Fu fang was administered as anemia therapy, enhancing hematopoietic stem cell proliferation to restore blood cell counts (He *et al.* 2021). Vincristine, a chemotherapeutic agent, exerts cytotoxic effects by disrupting cellular microtubule formation, including tumor cell replication (Hantrakul *et al.* 2014).

## ■ CONCLUSION

Based on clinical signs, anamnesis, physical examination, and diagnostic evaluations, the canine patient, Spring, presented with a Transmissible Venereal Tumor and anaplasmosis. The treatment included doxycycline and Fu fang Ejiao Jiang herbal supplements. Chemotherapy with vincristine addresses the Transmissible Venereal Tumor.

## ■ ASSOCIATED CONTENT

### Supporting Information

†The hematology and blood biochemistry were submitted in PDF form as supporting information.

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## ■ REFERENCES

- Abeka YT. 2019. Review on canine transmissible venereal tumor (CTVT). *Cancer Therapy & Oncology*. 14(4):1-9.
- Atif FA, Mehnaz S, Qamar MF, Roheen T, Sajid MS, Ehtisham-ul-Haque S, Kashif M, Said MB. 2021. Epidemiology, diagnosis, and control of canine infectious cyclic thrombocytopenia and granulocytic anaplasmosis: emerging Diseases of veterinary and public Health Significance. *Veterinary Sciences*. 8(312):1-20.
- Allerton F. 2020. BSAVA small animal formulary 10th edition. Gloucester (UK): British Small Animal Veterinary Association.
- Balmori-de la Puente A, Rodríguez-Escolar I, Collado-Cuadrado M, Infante González-Mohino E, Vieira Lista MC, Hernández-Lambrano RE, Sánchez-Agudo JA, Morchón R. 2024. Transmission risk of vector-borne bacterial diseases (*Anaplasma spp.* and *Ehrlichia canis*) in Spain and Portugal. *BMC Veterinary Research*. 20(1):526.
- Boonhoh W, Sontigun N, Fungwithaya P, Wongtawan T. 2023. Hematological analysis of naturally infecting blood parasites in dogs. *Veterinary World*. 16(4):681-686.
- Chikweto A, Kumthekar S, Larkin H, Deallie C, Tiwari KP, Sharma RN, Bhaiyat MI. 2013. Genital and extragenital canine transmissible venereal tumor in dogs in Grenada, West Indies. *Open Journal of Veterinary Medicine*. 3(2):111-114.
- Dyachenko V, Pantchev N, Balzer H, Meyersen A, Straubiner RK. First case of *Anaplasma platys* infection in a dog from Croatia. *Parasite & Vectors*. 5(49):1-7.
- Guija-de-Arespacochaga A, Kremer L, Kunzel F, Schwendenwein I. 2022. Peripheral blood eosinophilia in dogs: Prevalence and associated diseases. *Veterinary Medicine and Science*. 8(4):1458-1465.
- Hantrakul S, Klangkaew N, Kunakomsawat S, Tansatit T, Poapolatthep A, Kumagai S, Poapolatthep S. 2014. Clinical pharmacokinetics and effects of vincristine sulfate in dogs with transmissible venereal tumor (TVT). *The Journal of Veterinary Medical Science*. 76(2):1549-1553.
- He D, Zhang H, Yi Z, Zhao D, Zhang S. 2021. Protective effects of Fufang Ejiao Jiang against aplastic anemia assessed by network pharmacology and metabolomics strategy. *Digital Chinese Medicine*. 4:328-342.
- Sainz A, Roura X, Estrada-Pena A, Kohn B, Harris S, Solano-Gallego L. 2015. Guideline for veterinary practitioners on canine ehrlichiosis and anaplasmosis in Europe. *Parasites & Vectors*. 8(75):1-20.
- Tommasi SD, Baneth G, Breitschwerdt EB, Stanneck D, Dantas-Torres F, Otranto D, de Caprariis D. 2014. *Anaplasma platys* in bone marrow megakaryocytes of young dogs. *Journal of Clinical Microbiology*. 52(6):2231-2234.
- Wu L, Saxena S, Singh RK. 2020. Neutrophils in the tumor microenvironment. *Advances in Experimental Medicine and Biology*. 1224:1-20.