

## Pulpitis Case in a Dog: Is Dirofilariosis the culprit?

Ali Evren HAYDARDEDEOĞLU<sup>1\*</sup>, Kerem URAL<sup>2</sup>

<sup>1</sup>Aksaray University, Faculty of Veterinary Medicine, Department of Internal Medicine, Aksaray/ TURKEY

<sup>2</sup>Adnan Menderes University, Faculty of Veterinary Medicine, Department of Internal Medicine, Aydın/ TURKEY

\*Corresponding author e-mail: ahaydardedeoglu@hotmail.com

### ABSTRACT

In the presented article, an interesting case was defined by the color change in the teeth. The case material consisted of 3.5 old female dogs was referred to the clinic for routine vaccination. In our study, it was determined that the patient had exercise intolerance, intermittent cough and shortness of breath. Patient; Complete blood count, serum biochemistry measurements, chest X-ray and detailed physical examination. The results of the rapid diagnostic test kit (SNAP 4DX) analysis revealed that the dog was infected with *Dirofilaria immitis*. During the patient's oral cavity examination, a pinkish color change was detected in the teeth as an unusual finding (Figure 1). The findings are discussed below.

**Key Words:** Dirofilariosis, Dog, Pulpitis.

### Bir Köpekte Pulpitis Olgusu: Dirofilaria Olağan Şüpheli midir?

#### ÖZ

Sunulan makalede dişlerde renk değişimi ile karakterize ilginç bir vaka tanımlandı. Olgu materyalini rutin aşılama için kliniğe getirilen 3.5 yaşlı dişi köpek oluşturdu. Alınan anamnezde hastada egzersiz intoleransı, aralıklı öksürük ve nefes darlığı olduğu belirlendi. Hasta; tam kan sayımı, serum biyokimya ölçümleri, akciğer grafisi ve detaylı fizik muayene ile değerlendirilmiştir. Hızlı tanı test kiti (SNAP 4DX) analiz sonuçları, köpeğin *Dirofilaria immitis* ile enfekte olduğunu ortaya koydu. Hastanın ağız boşluğu muayenesi sırasında, olağan dışı bir bulgu olarak, dişlerde pembemsi renk değişikliği tespit edildi (Şekil 1). Elde edilen bulgular aşağıda tartışılmıştır.

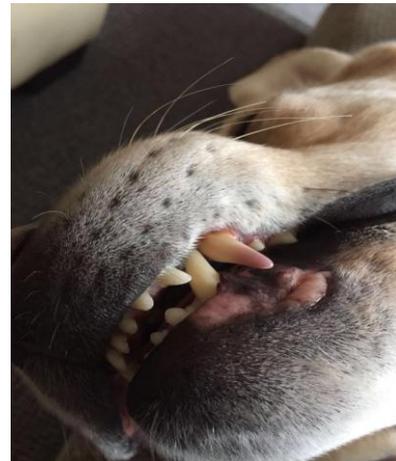
**Anahtar Kelimeler:** Dirofilaria, Köpek, Pulpitis.

## INTRODUCTION

In the veterinary practice or namely, clinical setting veterinary surgeons often rely on oral examination in an attempt to detect whether a dental procedure is required (Allione 1999). Indeed subgingival pathology (Allione 1999) or pulpal diseases may go undiagnosed. Endodontic disorders denote dental pulp damage, namely pulpitis. Pulpitis may be reversible or irreversible due to the severity of the illness. Minor trauma may be related to reversible pulpitis, where as inflammation related swelling and prevention of blood entering the root canal might cause irreversible pulpitis. Besides tooth fractures expose pulp tissue to bacteria located within the oral cavity. There was no tooth fracture in the present case, whereas probable hypothesis for probable bacterial infection might involve *D. immitis* harboured *Wolbachia* sp. This may be briefly explained with the relationship between *Dirofilaria* species and *Wolbachia* sp. *Dirofilaria immitis* is the main filariasis agent in dogs and cats, causing heartworm disease. *D. immitis*, like other filarial nematodes, harbours intracellular endosymbiotic bacteria belonging to the genus *Wolbachia* (Rickettsiales) (Bandi 2001). The association between filarial nematodes and *Wolbachia* is considered an obligatory (perhaps mutualistic) symbiosis (Casiraghi 2002). *Wolbachia*-associated molecules may interact with cells of the innate immune system such as macrophages and neutrophils (PMNs), thus contributing to the pathogenesis and immunology of filarial diseases (Bandi 2001, Brattig 2001, Taylor-Robinson1994). Another hypothesis interestingly causing discoloration of the teeth in the present case might be related to nitric oxide. Nitric oxide (NO) as a chemical compound, has long been recognized to possess pleiotropic effects, involving vasodilatation, immunomodulation and neurotransmission (Bogdan 2001). In immune responses, NO is known to be produced mainly by activated macrophages and to modulate Th1/Th2 balance, as well as to induce immunosuppression (Allione 1999, Taylor-Robinson1994, Dai 1999). In bacterial or protozoon-infected hosts, NO also serves as a toxic molecule against these pathogens (Casiraghi 2002). In contrast, macrophage NO production driven by living helminth parasites or their products is considered to be involved in immunosuppression through the prevention of worm-specific T-cell responses (Dai 1999, Atochina 2001, O'Connor 2000, Oliveira 1999)

Given the data that adult *D. immitis* worms located primarily within the pulmonary arteries of infected dogs, the vasodilatation initiated via NO

may serve to the maintenance of habitat spaces for the invading *Dirofilaria* species (Hiroyuki 2002). It may be safely suggested that *D. immitis*-derived factorsexist to facilitate parasitism of the worm through immunosuppression and arterial relaxation via NO (Hiroyuki 2002). In the present article an interesting case of discoloration of the teeth was reported. A 3.5 years old female dog was referred to clinic for routine vaccination. The owner reported exercise intolerance, intermittent coughing and dyspnea time to time. On initial referral complete blood count, serum biochemistry, chest x-ray and detailed physical examination were all performed. A point of care rapid diagnostic test kit (Snap 4dx plus) revealed that the dog was infected with *Dirofilaria immitis*. Routine blood work analysis were at normal physiological intervals. The only abnormality in haematological analysis was eosinophilia 16%. (Table 1) In parasitological diseases eosinophilia is known to be the expected blood result. Biochemical analyzes revealed that the values were within the reference range. In the clinical examinations was, a pinkish discoloration of the apical of the tooth detected in the detailed examination of the mouth. The presence of microfilariae was microscopically observed in the microfilm examination performed by the thick-drop method. To the present authors' knowledge the latter hypothesis might be confounding, as NO production via *D. immitis*, might be associated with pulpitis in this dog. Independently from the hypothesis withdrawn above, it may be safely suggested that tooth discoloration, nemaly pink teeth might be observed during parasitological/bacterial infections, which must be taken into consideration in veterinary practice, promptly requiring therapy application for preventing irreversible pulpitis.



**Figure 1.** Pulpitis in a dog. Discolored (pink) teeth.

**Şekil 1.** Bir köpekte Pulpitis olgusu. Dişlerde renk değişikimi.

**Table 1.** Haematological analysis (Eosinophilia 16%).  
**Tablo 1.** Hematolojik Analizde (%16 ezinofili).

WBC	LENF	MON	GRAN	LENF%	MON%	GRAN%	RBC	HGB	HCT
16.3X10 <sup>9</sup>	4.7X10 <sup>9</sup>	1.8X10 <sup>9</sup>	9.8X10 <sup>9</sup>	28.8%	10.9%	60.3%	7.10X10 <sup>12</sup>	13.9	45.7
MCV	MCH	MCHC	RDW%	PLT	MPV	PDW	PCT	EOS%	
64.4	19.5	30.4	13.2%	412X10 <sup>9</sup>	7.9	16.2	0.325%	<b>16.0%</b>	

## KAYNAKLAR

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