Acquired Laryngeal Paralysis in a Dog with Hypothyroidism: A Case Report

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Abstract: Laryngeal paralysis related to hypothyroidism is a rare disorder reported in dogs. A 12 year old, neutered female, Golden Retriever breed dog referred to Ankara University Animal Hospital with a history of dyspnea and gagging after feeding. Routine blood work was not revealed any abnormalities. Decreased levels of total T4 <0.5 µg/dL and Free T4 <0.35µg/dL were remarkable. The exact diagnosis of bilateral laryngeal paralysis confirmed endoscopically. Although laryngeal surgery was planned, the dog unfortunately died due to aspiration of the gastric contents. The current case here reflects a rare case of acquired laryngeal paralysis related to hypothyroidism in a dog.

Keywords: *Canine, Hypothyroid, Larynx, Paralysis.*

Hipotroidizmli Bir Köpekte Edinsel Larengeal Paraliz: Olgu Sunumu

Özet: Hipotroidizm ilişkili larengeal paraliz köpeklerde rapor edilmiş nadir bir sorundur. 12 yaşlı, kısırlaştırılmış dişi, Golden Retriever ırkı köpek Ankara Üniversitesi Hayvan Hastanesine gıda alımı sonrası solunum güçlüğü ve öğürme şikayetleriylegetirildi. Rutin kan analizleri herhangi bir anormallik göstermedi. Total T4 <0.5 µg/dLve Serbest T4 <0.35 µg/dL düzeylerinde azalma dikkat çekiciydi. Bilateral laringeal paralizin kesin teşhisi endoskopik olarak doğrulandı. Her ne kadar laringeal cerrahi planlandıysa da hasta maalesef mide içeriğinin aspirasyonu sonucu kaybedildi. Sunulan çalışma nadir bir olgu olan,bir köpekte hipotroidizm ilişkili edinsel laringeal paralizi yansıtmaktadır.

Anahtar Kelimeler: *Hipotroid, Köpek, Larenks, Paraliz.*

Introduction

Laryngeal paralysis is a well-described cause of upper respiratory stridor, gagging and dyspnea in dogs (Burbidge, 1995; Jeffery et al., 2006). Laryngeal paralysis results from the adduction failure of the arytenoid cartilages. Narrowing of the glottic lumen causes typical clinical signs (Ettinger and Feldman, 2010). However, neuromuscular manifestations such as laryngeal paralysis have been observed less frequently in dogs with hypothyroidism (Gaber et al., 1985; Jaggy et al., 1993).Primary clinical signs of neuropathy secondary to hypothyroidism can also be observed as gagging, stridor and dyspnea related to laryngeal paralysis in dogs (Ettinger and Feldman, 2010). This current case here reflects a rare report of acquired laryngeal paralysis in a dog with hypothyroidism.

Case History

A 12 year-old, 35 kg, neutered female Golden Retriever breed dog referred to Ankara University Small Animal Hospital of Veterinary Faculty with a history of lethargy, gagging, stridor and dyspnea for 2 days. The dog had routine vaccination against rabies, herpervirus and distemper infection, parvoviral enteritis, parainfluenza and leptospirosis. Physical examination revealed normothermia (39°C), normal heart rate (140 bpm) and capillary refill time (>3s) and tachypnea (respiratory rate 42-51 breaths per minute) with increased respiratory effort and stridor. Bilateral crackles were also auscultated in the cranial lung fields. The results of routine blood work including complete blood count, serum profiles and hormone analysis were shown in Table 1. Echocardiographic examination revealed any abnormalities of the heart. Loss of adduction on arytenoid cartilages and bilaterally laryngeal paralysis (Figure 1, Figure 2) during respiration were remarkable in endoscopic assessment. Hyperemia was present on larynx and aritenoid cartilages (Figure 3). Aspiration of the gastric contents to trachea was also observed in the dog (Figure 4).

Endoscopic assessment confirmed the exact diagnosis of bilateral laryngeal paralysis in the dog. Following medication were initiated: Dexamethasone injection (0.5mg/kg, IV sid), butorphanol (0.1 mg/kg, IV sid) and supplemental oxygen therapy. Because of the severe gagging levothyroxine tablets could not performed. Laryngeal surgery was planned immediately but the dog unfortunately died due to aspiration of the gastric contents after gagging (Figure 4). The owner declined postmortem examination.

Table 1. Blood work including complete blood count, serum profiles and hormone analysis.

	Results	Reference Ranges*		Results	Reference Ranges*
WBC 10^9/l	10.6	6-17	**MPV fl**	7	8-12
LYM 10^9/l	1.6	0.9.5	**Glucose mg/dl**	93.5	65-118
MONO 10^9/l	0.6	0.3-2.5	**Urea mg/dl**	16.4	15-59.9
EOS 10^9/l	1.7	0.1-19	**Creatinin mg/dl**	0.79	0.5-1.5
LYM %	15	12-30	**T. Protein g/dl**	6.96	5.4-7.1
MON %	6.4	2-13	**Albumin g/dl**	3	3.1-4
NEU %	63.3	35-70	**T. Bilirubin mg/dl**	0.18	0.1-0.3
RBC 10^{12}/l	6.37	5.5-8.5	**D. Bilirubin mg/dl**	0.08	-
HGB g/dl	17	12-18	**ALP IU/L**	40	20-156
HCT %	43	37-55	**ALT IU/L**	60.3	21-102
MCV fl	67.5	60-72	**AST IU/L**	29.2	23-66
MCH pg	26.7	19.5-25.5	**CK IU/L**	97	<200
MCHC g/dl	39.6	32-38.5	**GGT IU/L**	1.7	6-28
RDW %	14.5	12-17.5	**Na mmol/L**	134	140-154
PLT 10^9/l	421	200-500	**K mmol/L**	4.4	3.8-5.6
tT4	<0.5	1.3-2.9	**fT4pmol/L**	<0.35	0.7-2.1

*Kaneko et al., 2008.

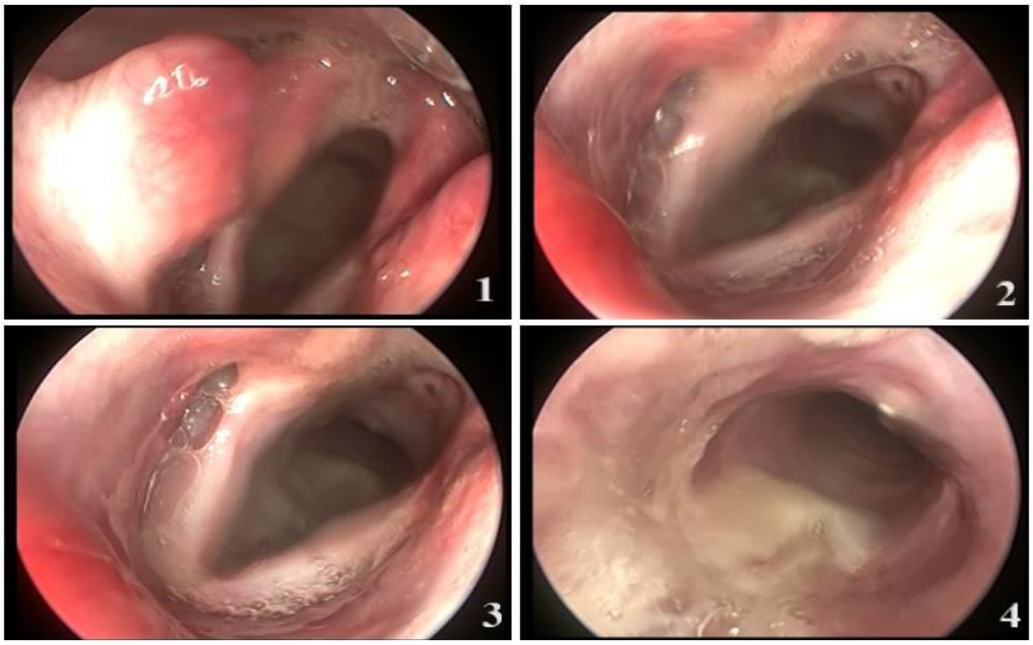

Figure 1. Remarkable loss of adduction on laryngeal arytenoid cartilages. **2)** Remarkable bilaterally laryngeal paralysis and gastric contents surrounding larynx. **3)** Hyperemic larynx and arytenoid cartilages. **4)** Aspiration of the gastric contents to trachea after gagging.

Discussion

Laryngeal paralysis is a common cause of upper airway disease and obstruction in older, large breed dogs, especially Labrador and Golden Retrievers (Snelling and Edwards, 2003). Acquired or congenital reasons are the possible etiologies of the disease (Millard and Tobias, 2009). Acquired form of the laryngeal paralysis is associated with peripheral neuropathy, trauma, iatrogenic injury or cervical mass (Braun et al., 1989; Klein et al., 1995). However, hypothyroidism as a cause of laryngeal paralysis have been observed less frequently in dogs and, the association between two conditions is still unknown (Burbidge, 1995; Jaggy et al., 1994). The current case here reflects hypothyroidism induced acquired laryngeal paralysis in a Golden Retriever breed dog. Upper respiratory stridor, gagging and dyspnea are the most common symptoms of the dogs with laryngeal paralysis (Burbidge, 1995; Jeffery et al., 2006; Millard and Tobias, 2009). The symptoms in the dog presented

here were consistent with the reports previously described. Hypothyroidism is characterized by bilaterally alopecia, dry hair coat, weakness, bradycardia and weight gain. Neuromuscular manifestations such as laryngeal paralysis in dogs with hypothyroidism have also been rarely observed. In some dogs with hypothyroidism, laryngeal paralysis has become the only sign regardless of the stage of the disease (Panciera, 1994). The aim of the case presented here was to point out the acquired laryngeal paralysis without any other systemic and dermatological signs in a dog with primary hypothyroidism. Inspection of the larynx is essential for the exact diagnosis. Direct visualization of the larynx with laryngoscopy is considered the gold standard to rule out other possible etiological factors of laryngeal stridor (Broome et al., 2000, Radlinsky et al., 2009). In this case presented here, laryngoscopy was performed to make an exact diagnosis of stridor in the dog. Laryngeal inspection in dogs includes the evaluation of the arytenoid cartilages for active abduction during inspiration and passive adduction during expiration (Monnet and Tobias, 2012).

In endoscopic assessment of the case presented here loss of adduction on arytenoid cartilages and bilaterally laryngeal paralysis during respiration were remarkable. It has been reported that it is possible to be association between acquired myasthenia gravis and hypothyroidism in dogs (Shelton, 2002). Titers of acetylcholine receptor antibody in dogs with myasthenia gravis are essential for diagnosis. In the case here further diagnostic investigations could not be performed.

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