Turk. J. Vet. Anim. Sci.
2007; 31(5): 367-369

Case Report

Lyme Disease (Borreliosis) in a Saint Bernard Dog: First Clinical Case in Turkey

Erol Güçlü GÜLANBER[1,*], Aynur GÜLANBER[2], Reyhan ALBAYRAK[1],
Nusret Gürkan GÜLANBER[1], Erdal POLAT[3]

[1]G&G Academia Animal Hospital, Menekşeli Sok. No: 4, 1. Levent, İstanbul - TURKEY

[2]Department of Parasitology, Faculty of Veterinary Medicine, İstanbul University, Avcılar-İstanbul - TURKEY

[3]Department of Microbiology, Cerrahpasa Medicine Faculty, İstanbul University, İstanbul - TURKEY

Received: 28.04.2005

Abstract: Lyme disease is a zoonotic infection caused by the spirochete *Borrelia burgdorferi,* which is transmitted by ticks of the *Ixodes species.* This is the first clinical case report of Lyme disease in Turkey. The subject was a 2-year-old male Saint Bernard with recurrent shifting leg lameness that began at about 6 months of age. In sera samples, *B. burgdorferi* IgM, IgG, and Western Blot were found to be positive. Chronic borreliosis was diagnosed and a long-term amoxicillin treatment was recommended. One year after the initial presentation, the dog was asymptomatic according to the owner. A clinical examination performed 2 years after the diagnosis failed to find any evidence of clinical Lyme disease.

Key Words: Lyme disease, borreliosis, borrelia, dog, Turkey

Saint Bernard Irkı bir Köpekte Lyme Hastalığı (Borreliosis): Türkiye'de İlk Klinik Olgu

Özet: Lyme hastalığı, *Ixodes* keneleri tarafından bulaştırılan *Borrelia burgdorferi* spiroketinin meydana getirdiği zoonoz bir enfeksiyondur. Bu olgu Türkiye'de Lyme hastalığının ilk klinik raporudur. Olgu yaklaşık 6 aylıkken topallamaya başlayan ve değişik bacaklarda topallığın yeniden görüldüğü 2 yaşında, erkek, Saint Bernard ırkı bir köpekti. Serum örneklerinde *B. burgdorferi* IgM, IgG ile Western Blot testi pozitif olarak bulundu. Kronik Borreliosis tanısı konuldu ve uzun süreli amoksisilin tedavisi önerildi. İlk gelişinden bir yıl sonra sahibinin görüşüne göre köpeğin sağlıklı olduğu öğrenildi. İkinci yıl yapılan klinik muayenede Lyme ile ilişkili bir bulguya rastlanmadı.

Anahtar Sözcükler: Lyme hastalığı, borreliosis, borrelia, köpek, Türkiye

Introduction

Lyme disease is caused by the spirochete *Borrelia burgdorferi*, which is transmitted by *Ixodes* species. Lyme disease, which is a poly-systemic disease, is seen in dogs, cattle, horses, and humans (1-6).

Although Lyme disease has been reported in Europe, no clinical Lyme disease in dogs has been encountered in Turkey. Polat et al. (7) were the first to isolate the Lyme disease agent in *I. ricinus* collected from the Black Sea region of Turkey. Çalışır et al. (8) isolated the agent in *I. ricinus* collected from the recreational areas of İstanbul.

The pathogenesis of Lyme arthritis is still uncertain. Mice are the preferred hosts. Additionally, birds are important carriers as they carry ticks and spirochetes to distant areas. *Ixodes* ticks transmit *B. burgdorferi* vertically or horizontally during larval feeding (2-4,6).

Only about 5% of seropositive dogs develop the disease (9). There is no known breed or sex predisposition in dogs. Younger animals are more susceptible to the illness than older ones. Acute polyarthritis is the most common manifestation of the disease in dogs. Joint inflammation may develop in one or

*E-mail: gulanber@yahoo.com

more joints. An intermittent lameness may be seen in chronic cases. The symptoms usually disappear within a few days, but they tend to recur. Acute symptoms of the disease have mostly been reported in the summer (1-5). Furthermore, fever, lameness, lymphadenopathy, and anorexia may be seen.

Lyme disease diagnosis is a clinical diagnosis. To diagnose Lyme disease, the patient has to have appropriate clinical signs and positive serology, and the signs should disappear with proper antibiotic treatment. Serologic tests, such as IFA, ELISA, and Western Blot, are used to confirm the exposure to the organism. The ELISA technique, however, cannot distinguish the naturally infected dogs from the vaccinated ones. If the patient has received the Lyme vaccine, then positive serology may be found by the ELISA technique (2-5,10,11). On the other hand, the Western Blot technique and the newer C6 antigen ELISA (SNAP® 3Dx® - IDEXX Laboratories, Inc., USA) may distinguish these 2 conditions (12).

Recovery usually occurs within 2 to 3 days with antibiotic treatment. Tetracycline, Amoxicillin, Ampicillin, and Cephalosporin are preferred antibiotics. The disease may recur after several weeks or months, in which case the antibiotic regimen may be repeated. If the patient also has a joint dysfunction, non-steroidal anti-inflammatory drugs (NSAID) are used in conjunction with antibiotics (2-6,10). The most important and effective way to prevent the disease is to avoid tick exposure. Various products may be used for this purpose. Commercially available dead bacterial vaccines may reduce the incidence of the disease in the areas that are highly endemic for the infection (2-5,9,13,14).

Case History

A 2-year-old male Saint Bernard dog weighing 64 kg was brought to the clinic with a history of lameness that began when the dog was about 6 months old. Fever and anorexia were seen concomitantly with intermittent lameness. Prophylactic vaccines, except the Lyme vaccine, were administered. Tick infestation was present. On the physical examination, tenderness of the carpal, stifle, and tarsal joints was present.

Results and Discussion

A complete blood count and blood biochemistry analyses were performed by QBC Vet Autoread and IDEXX Vettest 8008, respectively, and revealed results within the reference range. No pathological lesions were found in the radiographs of the coxofemoral, scapulohumeral, carpal, or tarsal joints. By the ELISA method, *B. burgdorferi* IgM and *B. burgdorferi* IgG were found to be positive with a titer of 2.44 U/ml and 3.2 U/ml, respectively, and Rocky Mountain Spotted Fever, *Ehrlichia canis*, and Rheumatoid factors were found to be negative (Antech Diagnostics Lab., USA). Western Blot was also found to be positive (Antech Diagnostics Lab., USA). Borreliosis was diagnosed and Amoxicillin (Amoksina 1000 mg tablets, Mustafa Nevzat Inc. Turkey) at 20 mg/kg every 12 h per os for 30 days was prescribed. A non-steroidal anti-inflammatory drug (NSAID) (EtoGesic® 150 mg tablets, Fort Dodge Animal Health, USA) 10 mg/kg body weight was administered once a day after feeding. Lameness or tenderness was not observed during palpation of the joints on recheck 1 week after the initiating therapy. One year after the initial presentation, the dog was doing well according to the owner (contacted via telephone). A clinical examination performed 2 years after the diagnosis was unremarkable.

The history and clinical and laboratory findings of dogs with Lyme disease are similar to those found by previous researchers (1-6). This case demonstrates that this disease can be seen in dogs in Turkey. Regional epidemiologic research would be an asset for determining disease incidence. In dogs with lameness, especially if multiple joints are affected, clinicians should always consider tick-borne diseases. This is especially true if there are no definitive clinical or radiological findings.

In this patient, the diagnosis established by ELISA testing was definitive for natural exposure since our patient had not been vaccinated with Lyme vaccine. The Western Blot technique was used as a confirmation of the diagnosis since it was considered the first report of clinical Lyme disease in Turkey.

Amoxicillin was chosen instead of Doxycycline because its side effects with long term use were considered to be less likely. After 1 month of amoxicillin therapy, clinical symptoms disappeared and there was no recurrence for 2 years. It must be noted, however, that the eradication of Lyme infection does not appear to occur and that the organism might remain dormant for months, years, or for a lifetime, with the possibility of recurrence.

The presence of Lyme disease in Turkey is an indicator of a potential public health risk. Even though dogs are not reservoirs for human infection, the bite of an infected tick

transmits the disease to both dogs and humans. In addition, ticks usually do not detach until feeding is completed and do not reattach after feeding to another host. Owners of dogs have only a minimal risk of being infected through their mucosal tissue or skin if they remove the tick using their hands. More importantly, if owners and dogs are frequenting the same areas where Lyme disease carrying ticks are present, the owners need to be vigilant about possible tick exposure as well as clinical signs suggesting Lyme infection.

Different opinions exist among clinicians in Turkey regarding the applicability of Lyme disease vaccines. Considering the case we encountered, the climatic conditions in Turkey, and the facts that ticks are widely abundant in Turkey and that Polat et al. (7) and Çalışır et al. (8) isolated *Borrelia burgdorferi* from ticks of *I. ricinus*, we conclude that prophylactic vaccination and efforts to reduce tick burden will be the mainstays in the prevention of Lyme disease.

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