TÜRK PEDİATRİ ARŞİVİ
TURKISH ARCHIVES of PEDIATRICS

Case Report / Olgu Sunumu

Early localized Lyme disease in a pediatric patient: case report

Çocuk yaş grubunda erken lokalize Lyme hastalığı: olgu sunumu

Müge Baykan, İlknur Çağlar, Süleyman Nuri Bayram, İlker Devrim

Department of Pediatric Infectious Diseases, Dr. Behçet Uz Children's Diseases and Surgery Training and Research Hospital, İzmir, Turkey

Cite this article as: Baykan M, Çağlar İ, Bayram SN, Devrim İ. Early localized Lyme disease in a pediatric patient: case report. Turk Pediatri Ars 2019; 54(4): 264–6.

Abstract

Lyme disease is an illness caused by species of *Borrelia* spirochetes. Early diagnosis of lyme disease depends on the recognition of skin findings, which are seen in almost 80% of all cases. Erythema migrans is the most common skin lesion. Serologic tests can be used to support the clinical diagnosis. In this article, we report a six-year-old girl who was diagnosed as having early localized lyme disease, who presented with a rash on her right shoulder. The lesion was found consistent with erythema migrans. She had a history of tick bite seven days before the onset of the rash. Serologic test results were also consistent with lyme disease. Her skin lesion disappeared with cefuroxime treatment, and no additional symptoms or pathologic findings were observed on follow-up. Recognizing early signs is important for prompt diagnosis and treatment to prevent long-term complications because the diagnosis and treatment of late-stage lyme disease can be challenging.

Keywords: *Borrelia* burgdorferi; erythema migrans; Lyme disease

Öz

Lyme hastalığı, *Borrelia* cinsi spiroketlerin etken olduğu bir hastalıktır. Erken tanısı deri bulgularının tanınmasına bağlıdır. Bu bulgular tüm olguların yaklaşık %80'inde görülmektedir. Eritema migrans, en yaygın görülen deri bulgusudur. Serolojik testler klinik tanının desteklenmesi için kullanılabilir. Bu yazıda, kliniğimize sağ omzunda kızarıklık yakınması ile başvuran ve erken lokalize Lyme hastalığı tanısı alan altı yaşında bir kız hasta sunuldu. Kızarıklıktan yedi gün önce kene tutunması öyküsü vardı ve deri bulgusu eritema migrans ile uyumlu idi. Serolojik tetkikleri de Lyme hastalığı ile uyumlu saptandı. Sefuroksim tedavisi ile hastanın deri bulguları tamamen kayboldu; izleminde ek yakınma ya da hastalık bulgusu gözlenmedi. Geç evre Lyme hastalığının tanı ve tedavisinin zor olması nedeniyle; hastalığın erken belirtilerini tanımak, hızlı tanı ve tedavi ile uzun dönem ardsorunlarını önlemek açısından önemlidir.

Anahtar sözcükler: *Borrelia* burgdorferi; eritema migrans; Lyme hastalığı

Introduction

Lyme disease (LD) is an infectious disease caused by different spirochetes, which are included in the *Borrelia burgdorferi (Bb) sensu lato complex* transmitted by *Ixodes* ticks (1). It is characterized by involvement of multiple systems including the skin, joints, heart and the central nervous system. It has three main stages including early localized, early disseminated, and late LD, in which different clinical findings are observed (1). The diagnosis is made with recognition of skin findings, which generally occur in the early stage and with history. Localized erythema migrans (EM) is the characteristic skin sign; however, it may not occur in all patients and may be confused with cellulitis or other cutaneous lesions because it may have different forms and size, or secondary EM-like lesions may develop (1). In terms of diagnosis, the sensitivity of serologic tests is low in the early stage of the disease (1).

Recognition of cutaneous findings in LD, which is completely curable with early diagnosis, is important in terms of preventing long-term complications. Here, the importance of early diagnosis and treatment of LD is emphasized by presenting a 6-year old female patient who had an EM lesion and whose diagnosis was confirmed serologically.

Corresponding Author / Sorumlu Yazar: İlknur Çağlar E-mail / E-posta: dr_ilknur@yahoo.com
Received / Geliş Tarihi: 20.11.2017 **Accepted / Kabul Tarihi:** 27.07.2018

10.14744/TurkPediatriArs.2018.34356

Case

A six-year-old female patient presented to Dr. Behçet Uz Children's Diseases and Surgery Education and Research Hospital, Pediatric Infectious Diseases Outpatient Clinic with a symptom of redness that developed following tick attachment to the right shoulder about seven days ago. Physical examination revealed a purple-red, oval, blanchable, painless and nonpruritic annular erythema with a size of about 15x25 cm with regular borders in the region of the right scapula (Fig. 1). The lesion of the patient was found to be compatible with erythema migrans. Lyme disease was considered with the history and clinical findings and oral cefuroxime treatment (30 mg/day) was initiated. The *Bb* immunoglobulin (Ig)-M antibody, which was tested serologically using enzyme-linked immunosorbent assay (ELISA), was found to be positive, and IgG antibody was found to be negative. Treatment of the patient, whose diagnosis of LD was also confirmed serologically, was completed in 14 days. The lesion started to blanch on the 10th day of treatment and completely disappeared on the 21st day of the follow-up. No additional findings related to the disease were observed.

Written consent was obtained from the patient's parents for recording and publishing the data.

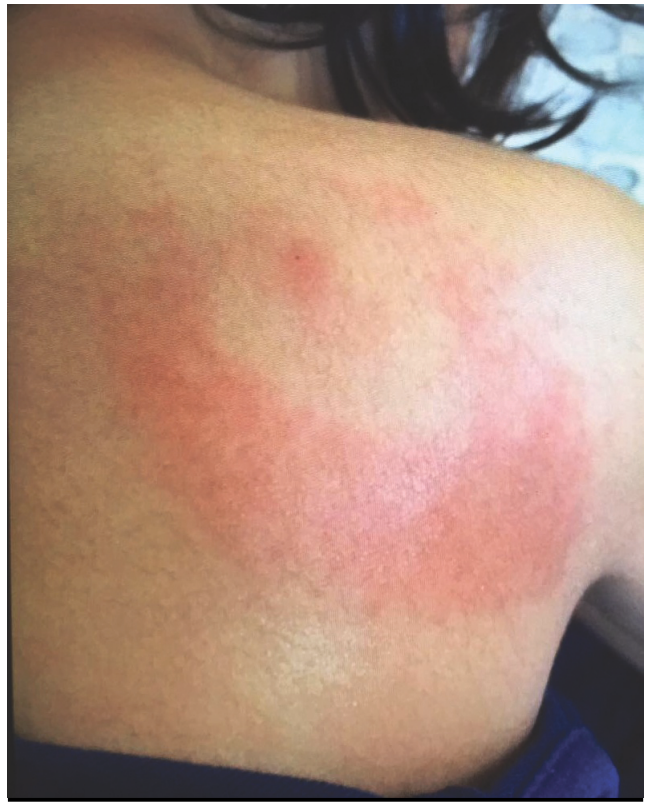

Figure 1. Appearance of erythema migrans in the region of tick attachment

Discussion

Lyme disease is a common vector-borne disease. It is observed more commonly in summer months when ticks in the nymph stage, which are difficult to recognize when they are attached, are observed more commonly. Although it is observed in both sexes and in all age groups, it most commonly affects children aged below 15 years and adults between the ages of 30 and 59 years (2).

The diagnosis of LD is generally made with clinical findings and history (1). Clinical findings show variance by the stage of the disease. In the stage of early localized LD, erythema migrans, which is the most common and most prominent skin lesion of the disease, is observed (1, 3). Generally, it develops 3–30 days after tick attachment; this period is sometimes known to prolong up to six months (1). The lesion starts as a red macule or papule with nonspecific appearance in the site of tick attachment; it rapidly increases in size and transforms into a ring with a diameter of >5 cm, which sometimes shows paleness in the center. It is generally nonpruritic and painless. The size of the lesion depends on the duration of the disease and site of localization (1). Although it may be observed in any part of the body, it is most commonly observed in the head-neck region, extremities, back, and abdomen in children (1, 3). It may also develop in a region other than the site of tick attachment (1, 2). In early stage LD, additional non-specific signs and symptoms including mild fever, arthralgia, myalgia, malaise, headache, lymphadenopathy, neck stiffness, nausea, and loss of appetite may also be observed (1, 3). Interrogation of patients who have these findings in terms of history of tick attachment, is very important for the diagnosis. In our patient's history, it was learned that tick attachment occurred seven days ago in addition to the skin lesion that was compatible with EM in the region of the right scapula; a prediagnosis of early localized LD was made with these clinical findings. Treatment of LD varies according to the clinical stage; the preferred antibiotics include doxycycline, penicillin, amoxicillin and cephalosporins (1, 3). Serologic tests were requested for our patient to support the diagnosis and cefuroxime treatment was initiated.

The most commonly used method in serology is investigating *Bb* antibodies using ELISA (1). In the diagnosis of early-stage LD, serologic methods (ELISA and Western Blot analysis) may be used to support the clinical diagnosis. However, their sensitivities and specificities are limited (1). The *Bb* IgM antibody, which was tested to confirm the diagnosis, was found to be positive and IgG antibody was found to be negative in our patient. In the literature,

it is known that IgM antibody levels start to increase 2–4 weeks after the causative agent is acquired, peaking in 6,8 weeks, and IgG antibodies start to increase later (1, 3, 4). This was compatible with the antibody levels in our patient who had a history of tick attachment about seven days ago. With these results, the diagnosis of early localized LD was also confirmed serologically. Cefuroxime treatment was completed in 14 days.

In early disseminated LD, multiple, small, secondary lesions similar to EM may be observed a few weeks after tick attachment. Systemic symptoms including mild fever, arthralgia, myalgia, headache, and fatigue are also common in this stage. Cranial and peripheral nerve involvement, central nervous system involvement, eye involvement, and less commonly, cardiac involvement and related clinical pictures may be observed. In late stage LD, neurologic and cardiac findings or arthritis may develop. Neurologic involvement develops in 10–15% of the patients; it is manifested by cranial nerve involvement (frequently bilateral facial paralysis) or radiculoneuropathy (1, 3). In the advanced stage of neurologic involvement, chorea, demyelinating encephalopathy, and transverse myelitis may develop. Carditis and rhythm disorders including variable atrioventricular block are found in patients with cardiac involvement. Joint findings related to LD develop in approximately 80% of patients and show variation (1, 3). Asymmetrical, non-erosive oligoarthritis involving large joints including the knee, ankle, shoulder, and hip may be found following migratory arthralgia (1, 2). No signs and symptoms of early disseminated or late-stage LD were observed in the follow-up of our patient.

Although LD occurs commonly worldwide, a limited number of patients have been reported from our country. However, tick attachment should be interrogated in detail in the history, especially in patients who live in rural regions and/or who have suspicious cutaneous findings. If tick attachment is present in the history, LD should be considered in the prediagnosis, and development of complications should be prevented with initiation of early and efficient treatment.

Informed Consent: Written consent was obtained from the patient's parents for recording and publishing the data.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - M.B., İ.Ç., S.N.B., İ.D.; Design - M.B., İ.Ç., S.N.B., İ.D.; Supervision - M.B., İ.Ç., S.N.B., İ.D.; Data Collection and/or Processing - M.B.; Analysis and/or Interpretation - M.B., İ.Ç., S.N.B., İ.D.; Literature Review - M.B.; Writing - M.B., İ.Ç.; Critical Review - S.N.B., İ.D.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Hasta Onamı: Bilgilerin kaydedilmesi ve yayını açısından hastanın ailesinden yazılı onam alındı.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - M.B., İ.Ç., S.N.B., İ.D.; Tasarım - M.B., İ.Ç., S.N.B., İ.D.; Denetleme - M.B., İ.Ç., S.N.B., İ.D.; Veri Toplanması ve/veya İşlemesi - M.B.; Analiz ve/veya Yorum - M.B., İ.Ç., S.N.B., İ.D.; Literatür Taraması - M.B.; Yazıyı Yazan - M.B., İ.Ç., S.N.B., İ.D.; Eleştirel İnceleme - S.N.B., İ.D.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Mali Destek: Yazarlar bu çalışma için mali destek almadıklarını beyan etmişlerdir.

References

1. American Academy of Pediatrics. Lyme Disease (Lyme Borreliosis, Borrelia burgdorferi Infection) In: Kimberlin DW, Brady MT, Jackson MA, Long SS, editors. Red Book: 2015 Report of the committee on infectious diseases. 30th edition. Elk Grove Village, IL: American Academy of Pediatrics 2015.p.516–25.
2. Aguero-Rosenfeld ME, Wang G, Schwartz I, Wormser GP. Diagnosis of Lyme Borreliosis. J Clin Microbiol 2005;18: 484–509. [CrossRef]
3. D'Alessandro M, Loy A, Castagnola E. Management of lyme disease in european children: a review for practical purpose. Curr Infect Dis Rep 2017; 19: 27. [CrossRef]
4. Cutler SJ, Rudenko N, Golovchenko M, et al. Diagnosing Borreliosis.Vector Borne Zoonotic Dis 2017;17: 2–11. [CrossRef]