

A rare case of tick infestation of the eyelid: case report and literature review

Um caso raro de infestação de carrapatos da pálpebra: relato de caso e revisão da literatura

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ABSTRACT

This article presents a case of tick infestation of the lower eyelid by a previously unreported species. A 71-year-old male presented with a tick attached to the lower eyelid. The tick was identified morphologically, and then molecularly via polymerase chain reaction (PCR) and sequencing of its DNA. In addition, a review of the literature relevant to the genera of ticks associated with infestation of the human eye is provided. The tick, which was in the nymphal developmental stage, was first identified according to taxonomic keys as Dermacentor sp. For complete species identification, 16s rDNA gene PCR and sequencing were performed, which showed that the tick was D. marginatus. Systematizing tick species could assist physicians in determining the potential for transmission of tick-borne human diseases.

Keywords: Tick infestations/parasitology; Eye infections, parasitic; Eyelids/pathology; Polymerase chain reaction; Base sequence; Dermacentor/parasitology; Bites and stings; Case reports

RESUMO

Este artigo apresenta um caso de infestação por carrapatos da pálpebra inferior por uma espécie previamente não declarada. Um homem de 71 anos de idade apresentou-se com um carrapato grudado na pálpebra inferior. O carrapato foi identificado morfológicamente, e, em seguida, uma estrutura molecular através de reação em cadeia da polimerase (PCR) e a sequenciação do seu DNA. Além disso, uma análise da literatura pertinente aos gêneros de carrapatos associados à infestação do olho humano é fornecido. O carrapato, que estava em fase de desenvolvimento das ninfas, foi identificado pela primeira vez de acordo com chaves taxonômicas como Dermacentor sp. Para identificação de espécies completa, gene 16S rDNA PCR e sequenciamento foram realizadas, que mostrou que o carrapato foi D. marginatus. Sistematizando espécie de carrapato poderia ajudar os médicos a determinar o potencial de transmissão de doenças humanas transmitidas por carrapatos.

Descritores: Infestações por carrapato/parasitologia; Infecções oculares parasitárias; Pálpebras/patologia; Reação em cadeia da polimerase; Sequência de bases; Dermacentor/parasitologia; Mordeduras e picadas; Relatos de casos

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INTRODUCTION

Ticks are acarine ectoparasites, and are among the most important vectors of human and animal diseases. Tick-borne diseases are a significant threat to public health. Ticks infected with microbiological agents (primarily viruses, bacteria, and protozoa) transmit diseases to vertebrate hosts while feeding on their blood^{1,2}. In Turkey, numerous tick species attached to humans have been reported^{3,4}, and they transmit very serious diseases, including Crimean-Congo hemorrhagic fever, tick-borne rickettsiosis, and Lyme disease⁵⁻⁷. Tick infestation of the eyelid is a rare condition. Herein we report on a 71-year-old man with a tick attached to the right lower eyelid that was identified morphologically and molecularly, and a review of the literature relevant to the genera of ticks associated with infestation of the human eye.

CASE PRESENTATION

A 71-year-old man with a two-day history of a small gray lesion on the medial aspect of the lower right eyelid presented to Nigde State Hospital, Ophthalmology Clinic with itching and localized redness caused by tick infestation. He was a farmer from a rural region and had contact with farm animals, which we considered was the likely source of tick infestation. Ophthalmologic examination showed a two millimeter elevated light gray lesion compatible with a tick on the medial aspect of the right lower eyelid (Figure 1). The head of the tick was embedded in the skin of the eyelid and its body moved during manipulation with tweezers. The remainder of the eye examination, including visual acuity and anterior segment examination, was normal. The patient did not have any systemic symptoms at presentation.

The tick was successfully removed using tweezers. The patient's blood was drawn to screen for thrombocytopenia; the platelet count was normal at presentation and one month later. During follow-up, one week post presentation, erythema of the lower eyelid was found to have subsided without the use of topical medication. The tick was sent to the laboratory of the School of Veterinary Medicine, Protozoology and Entomology at Ankara University for further investigation and identification. The tick, which was in the nymphal developmental stage, was identified according to taxonomic keys⁸ as *Dermacentor* sp. For complete species identification 16s rDNA gene PCR and sequencing were performed⁹, which showed that the tick was *D. marginatus*.

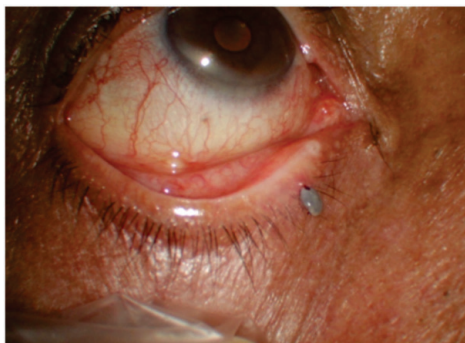


Figure 1: *D. marginatus* attached to the medial aspect of the patient's right lower eyelid.

DISCUSSION

Ticks embedded in the meibomian gland orifice or in the eyelash margin generally manifest as a mass on the eyelid margin. The most frequent symptomatic eye manifestations are conjunctivitis, uveitis, keratitis, and vasculitis¹⁰. The genera of ticks that have attached to human eyelids have been described previously: the nymphal form of *D. auratus* was the first documented tick embedded in the human eyelid¹¹; Hara et al. reported *Ixodes ovatus Neumann* in a 30-year-old female's right superior eyelid¹²; Santos-Bueso et al. reported *Rhipicephalus sanguineus* for the first time in a 21-year-old female's right upper eyelid¹⁰; Samaha et al. reported a nymphal stage tick of the genus *Hyalomma*, but of an unspecified species in a 58-year-old female's left upper eyelid margin¹³; and McLeod described *I. ricinus* in an 11-month-old girl and reported that *I. ricinus* was the most common tick in Scotland, Wales and the West of England¹⁴.

Bodé et al. reported that in addition to human eyelids, tick infestation can occur in conjunctival tissue; they identified a tick embedded in the conjunctiva as the larval form of *Amblyomma americanum*¹⁵. Singh et al. reported an 11-year-old girl living in an urban region of Singapore with *Ixodes* sp. infestation of the upper eyelid; however, despite the fact that ticks are more common in rural environments, they reported that tick infestation of the eyelid can occur in urban regions¹⁶. Liolios et al. reported a 40-year-old female in England with a tick of the *Ixodes* genus on her left lower eyelid, without any other ophthalmological findings¹⁷.

Ticks must be removed as soon as possible, as animal and human studies have shown that the risk of disease transmission increases after 24 hours of attachment and increases significantly after 48 hours¹⁸. Holak et al. reported Lyme borreliosis in 1 of 5 patients diagnosed with left abducens nerve palsy following *Ixodes* genus infestation of the eyelid region¹⁹. Keklikci et al. reported another tick described as *I. ricinus* in a three-year-old girl's right upper eyelid margin. They advised removing such ticks as soon as possible via mechanical procedures to prevent disease transmission²⁰. While a tick is attached, or after its removal, an inflammatory reaction leading to abscess formation or secondary infections may occur¹⁸. Sakalaret al. reported on a four-year-old girl with cellulitis due to infestation by the nymphal form of a tick of the *Ixodes* genus²¹.

It is important to know that ticks can produce one or more toxins that cause tick paralysis by blocking the neuromuscular system. Symptoms can be local, such as facial nerve paralysis, or systemic. Commonly, there is an ascending flaccid motor paralysis that occurs within hours or up to a few days after tick bites. The paralysis usually progresses to respiratory failure and even death. Almeida et al. described tick paralysis in a 28-year-old male due to immature stages of ticks, probably of the *Amblyomma* genus. Their patient had shown loss of muscle strength, decreased reflexes, and marked palpebral ptosis. The ticks were removed individually, and the patient's ptosis improved six hours after the last tick was removed. The following day there was near total regression of manifestations. The researchers recommended that all cases of suspected tick paralysis should be promptly diagnosed and treated²².

Tick paralysis has been described in Turkey: Gürbüz et al. reported a three-year-old girl with facial palsy caused by *Hyalomma marginatum*²³; Engin et al. described tick paralysis with atypical upper trunk involvement of the brachial plexus in a 66 year-old male farmer²⁴; and Doğan et al. reported a case with peripheral facial nerve paralysis due to a tick of the genus

Hyalomma attached to the external auditory canal²⁵. It is also important to know that *D. marginatus* can also cause tick paralysis: Abdigoudarzi et al. described tick paralysis in a 48-year-old female in Iran caused by *D. marginatus*²⁶.

In Turkey, *D. marginatus* ticks are known to transmit the following disease pathogens to humans: *Rickettsia slovaca* and *R. raoultii*, which cause TIBOLA/DEBONEL (tick-borne lymphadenopathy/ *Dermacentor*-borne necrosis erythema and lymphadenopathy)⁷, and Crimean-Congo hemorrhagic fever virus²⁷. In addition, *Coxiellabrunetti*, Omsk hemorrhagic fever virus, *R. sibirica* subsp. *sibirica*, and *Francisellatularensis* are transmitted by *D. marginatus* ticks, but such transmission has yet to be observed in Turkey.

Tick infestation of the human eyelid is rare. Systematizing the species of ticks that attach to the eyelid can alert physicians to the potential for transmission of the above-mentioned disease pathogens. Timely mechanical removal of ticks is an easy, safe, and effective method of preventing tick-associated systematic and local ocular complications.

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