



## Case report

## Deer tick masquerading as pigmented conjunctival lesion

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## ABSTRACT

**Purpose:** Conjunctival adherence of a tick is an uncommon event with few reports previously cited in the literature. We report a unique case of tick penetration, specifically a black-legged deer tick (*Ixodes scapularis*), into the conjunctiva.

**Observations:** This patient experienced a 3-week history of unilateral mild ocular pain, decreased vision, and pigmented lesion of her right eye. Slit lamp examination demonstrated a tick attached to the conjunctiva. Pathology confirmed the insect exoskeleton. Visual appreciation of the tick demonstrated probable deer tick larval stage given the shape, size, pigmentation pattern and geographic location of the specimen. Polymyxin-trimethoprim eye drops were prescribed for use three times daily and loteprednol twice daily.

**Conclusions and importance:** Despite the low risk for Lyme disease, which is endemic to the Adirondack region where the patient was affected, doxycycline was prescribed for prophylaxis. In any case of suspected tick penetration to the ocular surface, immediate ophthalmologic consultation and prompt removal via the method mentioned above is recommended, as well as attention paid to the Infectious Diseases Society of America guidelines regarding prophylaxis.

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## 1. Introduction

Conjunctival adherence of a tick is an uncommon event with few reports previously cited in the literature.<sup>1–5</sup> We report a unique case of tick penetration into the conjunctiva secondary to a black-legged deer tick (*Ixodes scapularis*).

## 2. Case report

A Caucasian woman in her late 60s presented with a three-week history of a pigmented ocular lesion, blurry vision (20/25 OD, 20/25 OS) and occasional, mild ocular pain affecting her right eye. The symptoms started after a sudden foreign body sensation to the right eye while camping in the Adirondacks (New York, USA). The patient denied any other symptoms suggestive of systemic disease. On examination, a foreign body was noted on the nasal conjunctiva of the right eye, 1.5 mm posterior to the limbus, with

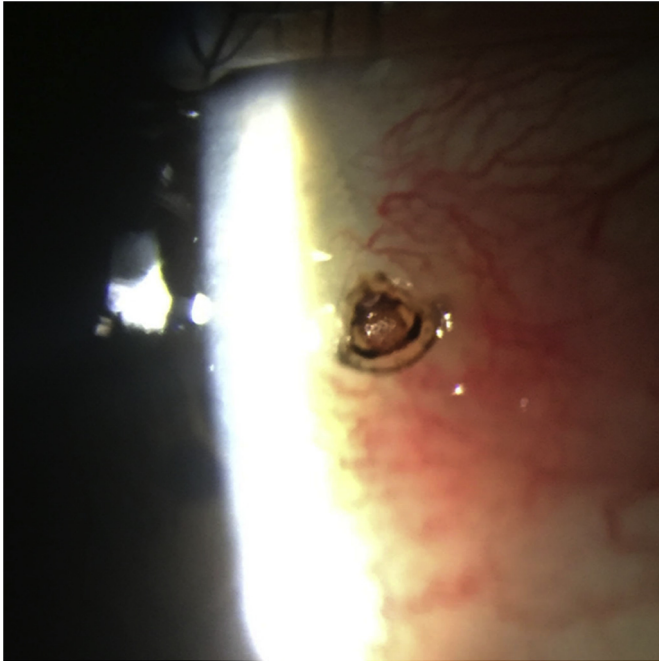
2 + conjunctival injection and prominent episcleral vessels (Fig. 1). Intraocular pressures were within normal limits in both eyes.

Topical proparacaine was applied for anesthesia and the foreign body was removed at the slit lamp examination using a 30-gauge needle and sent to pathology for analysis. The patient was instructed to use polymyxin-trimethoprim eye drops three times daily and loteprednol drops twice daily in the right eye for three days. The Pathology report returned and was “consistent with exoskeleton of an insect”, i.e. deer tick larva (Fig. 2). While formal staging of tick was not performed (larval, nymph, adult), visual appreciation of the tick demonstrated probable deer tick larval stage given the shape, size, pigmentation pattern and geographic location of the specimen.

The patient was started on doxycycline (100 mg PO) for 14 days as prophylaxis for Lyme disease, a tick-borne illness endemic to Northeastern United States. The Infectious Disease Society of America (IDSA) criteria for prophylaxis with doxycycline for the prevention of Lyme disease requires all of the following: 1) attached tick identified as an adult or nymphal *I. scapularis*; 2) tick estimated to have been attached for  $\geq 36$  h; 3) prophylaxis started within 72 h of tick removal; 4) local rate of infection of ticks with

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**Fig. 1.** Slit lamp visualization of the Ixodes tick larvae attached to the nasal conjunctiva of the patient's right eye, 1.5 mm posterior to the limbus. There was 2 + conjunctival injection and prominent episcleral vessels.



**Fig. 2.** *Ixodes scapularis* (deer tick) larva for the purpose of comparison. <1 mm in size. Note the six-legged characteristic of the larva.

*Borrelia burgdorferi* is  $\geq 20\%$ ; 5) no doxycycline contraindication.<sup>6</sup> While the patient did not definitively meet the first criterion, prophylactic therapy was started for several reasons. The extracted tick was not confirmed, but rather speculated to be of larval stage based on visual appreciation and identification of landmark characteristics (i.e. six legs). Thus, there is a possibility that the tick could have been in the nymphal stage or beyond. Based on the low side effect profile and a detailed discussion with the patient about the likelihood of Lyme disease transmission being low, she opted for treatment with prophylactic doxycycline treatment. Based on prophylactic treatment and low overall risk, Lyme serology was not drawn. On follow-up, the patient's ocular symptoms had resolved without developing any systemic symptoms of Lyme disease.

### 3. Discussion

Previous literature demonstrated six reports of tick adherence to the conjunctiva. Four of the six reports were secondary to *Amblyomma americanum*, one was secondary to *Otobius megninii*, and the last was of unknown species. The species unique to each report occurred in areas where the ticks are commonly found; for example, the four reports of *A. americanum* occurred in Arkansas, Texas, and Alabama. Our patient was camping in the Adirondacks, a portion of the Northeastern United States where the *I. scapularis* is more prevalent. Despite the limited number of reported cases, there appears to be no predilection for gender, age, or ocular location of tick attachment. In any case of suspected tick penetration to the ocular surface, immediate ophthalmologic consultation and prompt removal via the method mentioned above is recommended in order to minimize the localized inflammatory reaction and potential for infection transmission. Additionally, attention should be paid to the IDSA guidelines on when to initiate prophylaxis for any tick-borne diseases endemic to the region where the patient was affected.

### Patient consent

Patient consent was obtained orally and all patient identifiers were removed from the submission. Full adherence to the Declaration of Helsinki and all Federal and State laws.

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None.

### Conflicts of interest

EKC: Citrus Therapeutics (cofounder).  
 DRPA: Allergan (speaker, consultant, honoraria), Citrus Therapeutics (cofounder), Genentech (speaker, consultant, honoraria).  
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 LWG: None.

### Author contributions

All authors attest that they meet the current ICMJE criteria for Authorship.

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### References

- Jensen LA, Snow RL, Clifford CM. Spinöse ear tick, *Otobius megninii* attached to the conjunctiva of a child's eye. *J Parasitol.* 1982;68.
- Bode D, Speicher P, Harlan H. A seed tick infestation of the conjunctiva: *Amblyomma americanum* larva. *Ann Ophthalmol.* 1987;19:63–64.
- Meades KV, Lam G. Larva tick bite of the conjunctiva. *Aust N. Z J Ophthalmol.* 1991;19:365–366.
- Love MC, Platt L, Westfall CT. Lone-star tick bite of the conjunctiva. *Archives Ophthalmol.* 2001;119:1854–1855.
- Willen C, Mullen GR, Yee J, Read RW. Conjunctival attachment of a tick: clinicopathologic report of a case. *J Emerg Med.* 2011;40. e41–4.
- Wormser GP, Dattwyler RJ, Shapiro ED, et al. The clinical assessment, treatment, and prevention of Lyme disease, human granulocytic anaplasmosis, and babesiosis: clinical practice guidelines by the Infectious Diseases Society of America. *Clin Infect Dis.* 2006;43:1089–1134.