

# A Rare Case of Larval Tick Infestation at the Conjunctiva

## รายงานผู้ป่วยที่หายากจากตัวอ่อนของเห็บบนเยื่อตา



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### Abstract

This is a case report of a middle-aged man without underlying disease presented with acute pain in his left eye. Ocular examination showed an insect-like foreign body attached on his left lower palpebral conjunctiva. The foreign body was removed gently by non-toothed forceps and a cotton tip applicator. It was further identified as the larval form of *Amblyomma americanum* tick. A topical combination steroid-antibiotic medication was prescribed. It was further identified as the larval form of *Amblyomma americanum* tick. In summary, a thorough eye examination is necessary for the early recognition of this rare condition.

**Keywords:** *Amblyomma americanum*; conjunctiva; lone star; parasite; tick

### บทคัดย่อ:

รายงานผู้ป่วยชายวัยกลางคนไม่มีโรคประจำตัวมาด้วยอาการปวดตาซ้ายแบบเฉียบพลัน ตรวจตาพบสิ่งแปลกปลอมคล้ายแมลงติดอยู่ที่เยื่อตาส่วนหนังตาซ้ายล่าง ได้นำสิ่งแปลกปลอมนี้ออกจากตาด้วยคีมคิบบชนิดไม่มีเขี้ยวร่วมกับไม้พันสำลี ผู้ป่วยได้รับยาหยอดตาชนิดยาปฏิชีวนะและยาสเตียรอยด์ เมื่อนำไปตรวจพบว่าเป็นตัวอ่อนของเห็บชนิด *Amblyomma americanum* โดยสรุป การตรวจตาโดยละเอียดจำเป็นต่อการตรวจพบที่รวดเร็วในภาวะที่หายากนี้

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## Background

Ticks commonly infest humans but rarely attach to the conjunctiva. Only nine cases have been reported in the literature.<sup>1-8</sup> Furthermore, most cases have been identified in Western countries.<sup>1,2,4,5,8</sup> In this case, we discussed the clinical presentation and treatment of a patient with a tick affixed to the conjunctiva. Herein, we also summarize other cases published in the literature in comparison with our patient.

## Patients and Methods

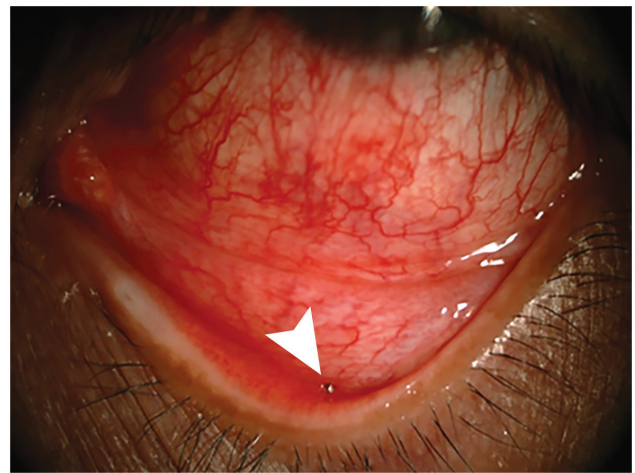
We report a case of conjunctival tick infestation (*Amblyomma americana*) in A case report was conducted at the Ophthalmology Clinic, Chiang Mai University Hospital. The study protocol was conducted in accordance with the tenets of the Declaration of Helsinki and the protocol was approved by the Ethics committee of the Faculty of Medicine, Chiang Mai University. A waiver of consent was granted based on a retrospective study and anonymized data analysis.

## Case Presentation

A middle-aged man presented to the outpatient unit of the Ophthalmology Department of Chiang Mai University Hospital complaining of left ocular pain for one day which worsened with blinking. He also had eye redness, tearing, and foreign body sensation, but the vision was normal. He refused any history of trauma to his eye. Before coming to the hospital, he rinsed his eye with tap water but did not mitigate the symptoms. Further history taking revealed that he has fostered several dogs at his house and had traveled to a dog kennel in Denver, the United States, recently. Otherwise, his past medical history was unremarkable.

His visual acuity was 20/20 in both eyes. On

slit-lamp examination, his left bulbar conjunctiva was markedly injected. A red-brown insect-like foreign body was found at the lower palpebral conjunctiva (Figure 1, arrowhead). Thorough examination revealed six movable legs and the buried head under the conjunctiva (Figure 2). The cornea, anterior chamber, and posterior segment exams were normal.



**Figure 1** A low magnification image shows an insect-like foreign body found at the injected lower palpebral conjunctiva (arrow head).



**Figure 2** A 100X magnification image shows a rounded body, six-legged insect-like organism with its head burrowed under the lower palpebral conjunctiva.

## Treatment

Topical 0.5% tetracaine anesthetic eye drops were applied before the gentle removal of entire parts of the foreign body by non-toothed forceps and cotton tip applicator. The patient was prescribed 0.1% dexamethasone phosphate in combination with 0.5% neomycin eye drops four times daily for three days, then tapered off. No other systemic medications were used.

## Outcome and follow-up

After three days, his left eye returned to normal and no signs of systemic infection such as fever and rash. His serologic tests for the vigilance of associated systemic diseases including complete blood count, liver function test, and erythrocyte sedimentation rate were within normal limits. The specimen was further identified by a parasitologist, affirming a complete removal of the larval stage of the tick. The presence of six legs and morphological structures including a single body region with short, broad, and rounded basis capitulum, short palpi with long hair, and a unique hypostome morphology corresponded to the characteristics of *Amblyomma americanum* larva. Unfortunately, we could not demonstrate the larval picture due to malfunction of hard disc.

## Discussion

*Amblyomma americanum* or a lone star tick is a parasitic arachnid, not an insect, which is a known or presumed vector for several diseases affecting humans.<sup>9,10-12</sup> Its endemic area is in the southeastern and eastern United States (Table 1). The common habitats are meadows, woodlands, and hardwood forests.<sup>10,13</sup> It is one of the most troublesome and economically

threatening ticks because of the aggressive and wide host range, any mammals.<sup>9</sup> In Thailand, *Amblyomma* spp. is rarely found in domestic and wild animals. Moreover, *A. americanum* has not been reported.<sup>14,15</sup>

Each female tick produces thousands of eggs deposited under leaves and plant litter.<sup>10</sup> After hatching, it develops through three life stages which are the six-legged larva, eight-legged nymph, and adult. Although, ticks cause irritation and inflammation at the attachment site, they are often overlooked due to their small size and the color that might mimic a conjunctival pigmented lesion.<sup>8</sup> Adult female lone star ticks are reddish-brown and have a distinctive white spot or “star” on the back, making them easily distinguished from other types of tick; however, this is not evident in the larval stage.<sup>10</sup>

Adult ticks are commonly found in humans<sup>9</sup>, but the conjunctival infestation of the larval stage of ticks is rare. There have been infrequent reports published in several areas, mostly in the United States.<sup>1-8</sup> The most identified species are *A. americanum* (Table 1). Nymphs and adults are the primary vectors of various diseases such as human monocytotropic ehrlichiosis and human granulocytic ehrlichiosis.<sup>9,13</sup> Hosts bitten by lone star ticks may be infected by various bacteria which could cause a southern tick-associated rash illness; but lone star ticks typically do not transmit *Borrelia burgdorferi* which is the cause of Lyme disease.<sup>10,11,12</sup>

The larval form, in contrast, typically does not transmit diseases because of its inexperience in feeding on any other hosts, having no chance of exposure to bacterial pathogens. Surprisingly, the species identified in our patient was the same as previously reported in the United States.<sup>1,2,4,5,8</sup> It is possible that the patient

**Table 1** The summary of case reports of tick infestation of the conjunctiva

| Authors, year of publication        | Tick                        |       | Patient    |        |            |                                      | Removal method  |
|-------------------------------------|-----------------------------|-------|------------|--------|------------|--------------------------------------|---|
|                                     | Species                     | Stage | Age (year) | Gender | Laterality | Geographic area                      |   |
| Jensen et al., 1982 <sup>1</sup>    | <i>Otobius megnini</i>      | larva | 2          | M      | OS         | Arizona, USA                         | mechanical removal with blunt forceps and cotton tip applicator |
| Bode et al., 1987 <sup>2</sup>      | <i>Amblyomma americanum</i> | larva | 28         | M      | OD         | Texas, USA                           | conjunctival excision   |
| Meades and Lam, 1991 <sup>3</sup>   | Unknown                     | larva | 27         | F      | NI         | NI                                   | conjunctival excision   |
| Love et al., 2001 <sup>4</sup>      | <i>A. americanum</i>        | NI    | 5          | F      | OD         | Arkansas, USA                        | conjunctival excision   |
|                                     | <i>A. americanum</i>        | NI    | 2          | F      | OS         | Arkansas, USA                        | conjunctival excision   |
| Willen et al., 2011 <sup>5</sup>    | <i>A. americanum</i>        | larva | 39         | M      | OD         | Alabama, USA                         | conjunctival excision   |
| Celik et al., 2014 <sup>6</sup>     | <i>Ixodes</i> spp.          | NI    | 36         | M      | OD         | Turkey                               | mechanical removal with blunt forceps                           |
| Teong et al., 2015 <sup>7</sup>     | <i>I. holocyclus</i>        | larva | 10         | M      | OD         | Sydney, Australia                    | conjunctival excision   |
| Kuriakose et al., 2016 <sup>8</sup> | <i>I. scapularis</i>        | larva | Late 60s   | F      | OD         | New York, USA                        | mechanical removal with 30-gauge needle                         |
| Current case                        | <i>A. americanum</i>        | larva | 56         | M      | OS         | Denver, USA/<br>Chiang Mai, Thailand | mechanical removal with blunt forceps and cotton tip applicator |

newly contracted the tick in Chiang Mai or imported an *A. americanum* larva from Denver. The larval tick could have tolerated the similar climate of these two places for several days before infestation.

Ophthalmology consultation is advised in cases with ticks affixed to the ocular regions. Surrounded conjunctival excision, the most effective method of removal, is usually required.<sup>2-5,7</sup> Although our patient was infested by the larval stage which usually does not transmit diseases, total removal of the tick was recommended to relieve symptoms and to minimize the inflammatory reaction.<sup>8</sup> In our case, despite the mouthpart being burrowed under the conjunctiva, we

were able to completely remove it with non-toothed forceps and a cotton tip applicator which had been proposed by Jensen et al,<sup>1</sup> Celik et al,<sup>6</sup> and Kuriakose et al.<sup>8</sup> Neither complications nor adverse sequelae occurred after treatment.

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#### Footnotes and Financial Disclosures

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