# Larval Tick Infestation Causing an Eruption of Pruritic Papules and Pustules

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## PRACTICE **POINTS**

- Larval ("seed") ticks can attack in droves, causing a widespread rash consisting of pruritic erythematous papules and pustules.
- Tiny black dots can be seen in some papules, which are the seed ticks themselves. Careful dermoscopic examination is critical to avoid easy misdiagnosis as hemorrhagic crust.
- We encourage providers to include larval tick infestation in the differential for eruptive pruritic papules and pustules with a history of outdoor exposure, especially during the summer months.

Ticks are well-documented human parasites and vectors of infectious disease. The larval ("seed") stage is 1 of 3 motile life stages, and larval ticks have been known to attack in droves, causing diffuse pruritic erythematous papules and pustules. In the absence of close examination, larval tick infestation can easily be missed in the wide differential for this clinical presentation. We present 2 cases of larval tick infestation occurring during the summer within the same month at a single institution. Our purpose is to encourage physicians to include larval tick infestation when generating a differential diagnosis for diffuse pruritic erythematous papules and pustules.

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## Case Reports

*Patient 1*—A 65-year-old woman presented to the dermatology clinic in July with a pruritic rash of 2 days' duration that started on the back and spread diffusely. The patient gardened regularly. Physical examination showed inflammatory papules and pustules on the back (Figure 1), as well as the groin, breasts, and ears. There was a punctate black dot in the center of some papules, and dermoscopy revealed ticks (Figure 2). Removal and microscopic examination confirmed larval-stage lone star ticks (Figure 3). The patient was prescribed topical steroids for pruritus as well as oral doxycycline for prophylaxis against tick-borne illnesses.

*Patient 2*—A 54-year-old man presented to the same clinic in July with pruritic lesions on the back, legs, ankles, and scrotum of 3 days' duration that first appeared 24 hours after performing yardwork. Physical examination revealed diffusely distributed papules, pustules, and

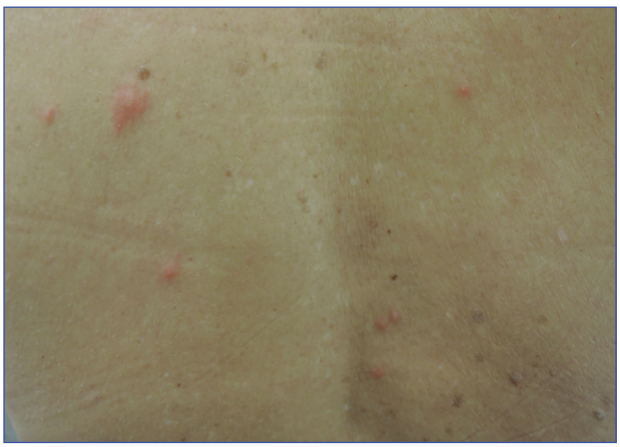

**FIGURE 1.** Multiple inflammatory papules and pustules on the back (patient 1).

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**FIGURE 2.** Dermoscopic view of an inflammatory papule with a punctate black dot revealed central attachment of a tick (patient 1). Dermoscopy prevented misdiagnosis as hemorrhagic crust.

**FIGURE 3.** Microscopic image of a lone star tick *(Amblyomma americanum)* with 6 legs (extracted from patient 1), consistent with a larval-stage tick.

vesicles on the back (Figure 4). Some papules featured a punctate black dot in the center (similar to patient 1), and dermoscopy again revealed ticks. Removal and microscopic examination confirmed larval-stage ticks. The patient was treated with topical steroids and oral antihistamines for pruritus as well as prophylactic oral doxycycline.

## Comment

Ticks are well-known human parasites, representing the second most common vector of human infectious disease.[1] Ticks have 3 motile stages: larva (or "seed"), nymph, and adult. They can bite humans during all stages. Larval ticks, distinguished by having 6 legs rather than 8 legs in nymphs and adults, can attack in droves and cause an infestation that presents as diffuse, pruritic, erythematous papules and pustules.[2-4] The first report of larval tick infestation in humans may have been in 1728 by William Byrd who described finding ticks on the skin that were too small to see without a microscope.[5]

**FIGURE 4.** Diffuse pruritic papules, pustules, and vesicles on the back (patient 2).

*Identification*—The ticks in both of our cases were lone star ticks (*Amblyomma americanum*). The larval stage of *A americanum* is a proven cause of cutaneous reaction.[6,7] A PubMed search of articles indexed for MEDLINE as well as a Google Scholar search using the terms *tick, seed tick,* or *tick bite* in combination with *rash, eruption, infestation, papule, pustule,* or *pruritic* revealed 6 reported cases of larval tick infestation in the literature (including our case); 5 were caused by *A americanum* and 1 by *Ixodes dammini* (now known as *Ixodes scapularis*); all occurred in July or August.[3,7-10] This time frame is consistent with the general tick life cycle across species: Adults feed from April to June, then lay eggs that hatch into larval ticks within 4 to 6 weeks. After hatching, larval ticks climb grass and weeds awaiting a passing host.[4]

*Diagnosis*—Larval tick infestation remains a frequently misdiagnosed etiology of diffuse pruritic papules and pustules, especially in urban settings where physicians are less likely to be familiar with this type of manifestation.[3,9-11] Larval ticks are submillimeter in size and difficult to appreciate with the naked eye, contributing to misdiagnosis. A punctate black dot may sometimes be seen in papules; however, dermoscopy is critical for accurate diagnosis, as hemorrhagic crust is a frequent misdiagnosis.

*Management*—In addition to symptomatic therapy, both of our patients received doxycycline as antibiotic prophylaxis for tick-borne illnesses given that a high number of ticks had been attached for more than 2 days.[12,13] Antibiotic prophylaxis for tick-borne illness is controversial. The exception is Lyme disease transmitted by nymphal or adult *I scapularis* when specific conditions are met: the bite must have occurred in an endemic area,

doxycycline cannot be contraindicated, estimated duration of attachment is at least 36 hours, and prophylaxis must be started within 72 hours of tick removal.[13] There are no official recommendations for the *A americanum* species or for larval-stage ticks of any species. Larval-stage ticks acting as vectors for disease transmission is not well documented in recent literature, and there currently is limited evidence supporting prophylactic antibiotics for larval tick bites. The presence of spotted fever rickettsioses has been reported (with the exception of *Rickettsia rickettsii* and *Ehrlichia chaffeensis*) in larval *A americanum* ticks, suggesting a theoretical possibility that they could act as disease vectors.[3,8,11,14-17] At a minimum, both prompt tick removal and close patient follow-up is warranted.

## Conclusion

Human infestation with larval ticks is a common occurrence but can present a diagnostic challenge to an unfamiliar physician. We encourage consideration of larval tick infestation as the etiology of multiple or diffuse pruritic papules with a history of outdoor exposure.

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