

An 'Exo-Tick' Problem: A Sudden Increase in Tick Bite – A Case Series

Abstract

Ticks are blood-sucking arthropod ectoparasites of vertebrates, which are vectors of many diseases. They cause varied skin manifestations, which occur either due to the attachment of the tick to the host or due to the infections it spreads. Dermoscopy serves as a precise diagnostic tool for tick bites and also helps in ensuring complete removal of the tick. Prompt removal and identification of the tick, along with appropriate antibiotic therapy, are important aspects of the management of this condition. Herein, we present a case series of nine patients with tick bites, by ticks of similar morphology but at different body sites and with varied predisposing factors.

Keywords: Dermoscopy, ixodes tick, tick bite

Introduction

Ticks are blood-sucking arthropod ectoparasites of vertebrates, which are vectors of many diseases.^[1] The public health impact of this is largely unmeasured but suspected to be quite high worldwide. Tick-borne diseases are wide spreading globally due to an increase in worldwide travel.^[2,3] Tick bites cause different cutaneous manifestations in humans. In some situations, health teams (and particularly dermatologists) can face difficulties to identify the lesions and associate them with the parasites.^[1] Dermoscopy serves as a specific diagnostic tool for tick bites.^[4] Any tick found should be immediately and completely removed. Herein, we present a case series of nine patients with tick bites coming from different localities in the vicinity of our hospital with varied predisposing factors.

Case Description

Nine patients presented to our outpatient department during a period of 1 month with tick bites. They gave a history of pain and a burning sensation at the site of the bites. The site of the bites was different for each patient.

The first patient was a 60-year-old male with no known co-morbidities who complaints of pain and a burning sensation behind his left ear for three days. He had a history of

bathing in a river within a week. On clinical examination, a yellowish-orange-colored papule resembling a skin tag was seen on his left retroauricular crease [Figure 1]. On dermoscopic examination, the lesion was identified as an engorged tick. It was found to be moving its legs and being attached to the skin by means of its mouthparts. The surrounding skin showed erythema and tick feces. An alcohol swab was applied to the site to remove the insect; however, it remained attached even after one hour. The tick was then carefully removed using a radiofrequency probe so that no mouth parts were left attached to the skin. The patient was treated with topical and systemic antibiotics. The removed tick was sent to the entomologist and was identified as belonging to the *Ixodidae* family.

During the next few days, several cases of tick bites [Figure 2] by ticks of similar morphology presented in the outpatient clinic. None of the patients reported a fever or other systemic symptoms. Removal of the tick was done without leaving any parts attached to the skin. Patients were managed with topical and systemic antibiotics (Doxycycline or azithromycin). We noticed that a few of these ticks were yellow in color [Figure 3], and a few of them were black in color [Figure 4]. All of them were identified as belonging to the *Ixodidae* family by entomologists.

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Figure 1: Clinical photograph of tick seen on the left retro auricular crease of the patient



Figure 2: Clinical photograph of tick seen on left axilla of the patient

All these cases were reported between October and December 2022. Increased travel rates to forests as well as increased exposure to arecanut and rubber plantations during this period by the people could be postulated as a cause for this sudden increase.

Details of the cases are listed in Table 1.

A video of one of the ticks removed with its intact mouthparts seen through dermoscopy (DinoLite AM4113/AD 4113 series, polarized mode, x50) has been given in Video 1.

Discussion

Ticks are arthropods belonging to the Arachnida class, which includes spiders, scorpions, and mites.^[5] There are around 850 species distributed in the *Ixodidae* (hard ticks), *Argasidae* (soft ticks), and *Nuttalliellidae* families. Ticks from the *Ixodidae* family have a body protection shield that is resistant to moderate pressures as long as the arthropod is not engorged due to the ingestion of blood. These ticks will painlessly attach to their hosts and will remain until they change their phase in the life cycle, when they detach and fall to the ground.^[5] Ticks from the *Argasidae* family do not have the protective shield and are almost always parasitic to birds, with no medical importance, as do the single species from the *Nuttalliellidae* family.

There are four stages in its life cycle – egg, larva, nymph, and adult. An adult female requires a blood meal before egg laying.^[6] It lays a large batch of eggs and dies. The larva and nymph also require blood meals for further development. They attach to host animals when the host comes near the vegetation where they reside. The tick uses its toothed mouthparts to cut through the epidermis.

Then it thrusts the hypostome through the opening created and penetrates the dermis. A protein cement secreted in its saliva causes the anchoring of the mouthparts to the skin.

A tick bite causes different cutaneous manifestations in humans.^[1] Primary lesions are either due to toxins and irritants in saliva or due to fragments of the mouthpart. Secondary lesions are due to tick-borne diseases where they serve as vectors, and these include Rocky mountain spotted fever, tick-borne lymphadenopathy, several types of viral encephalopathy and hemorrhagic fevers, Lyme disease, tularemia, and babesiosis.^[1]

Diagnosing tick bites and the diseases born by them may pose difficulty for inexperienced doctors. Dermoscopy will aid in the diagnosis and treatment.^[4]

Tick removal should be done carefully so as not to leave any mouthparts *in situ*. Removal of the tick as early as possible is important because the risk of infectious disease transmission is minimal if it is removed within 24 hours.^[7] Removal of the tick can be done by methods like application of an alcohol swab, using a radiofrequency electrode in minimal energy mode,^[8] limited surgical excision,^[9] or using a sterile needle under magnification.^[1] Another method of tick removal is to inject a wheal of lignocaine with epinephrine intradermally beneath the tick. Antibiotic therapy should be commenced in case of symptoms of headache or fever. Tetracyclines are the antibiotics of choice for most of the tick-borne diseases.^[6]

Conclusion

Multiple patients from non-endemic areas presenting with tick bite lesions at around the same time period may signify the spread of tick-borne diseases to newer areas. The fact that most of the patients had no history of direct contact

Table 1: Clinical details of the patients who presented with tick bite

Serial no.	Age	Sex	Symptoms	Site of bite	Any predisposing habits	Mode of removal
Case 1	60 years	Male	Pain, burning sensation	Left retro auricular crease	History of bathing in a river	Radiofrequency
Case 2 (spouse of case 3)	43 years	Female	Pain, burning sensation	Abdomen, left axilla		With sterile needle, under magnification
Case 3 (spouse of case 2)	48 years	Male	Pain, burning sensation	Left retro auricular crease	Did some work with arecanuts	With sterile needle, under magnification
Case 4	19 years	Male	Pain, burning sensation	Right side of neck	History of playing football in an area surrounded by vegetation few days back	With sterile needle, under magnification
Case 5	9 years	Female	Pain, redness, burning sensation	Umbilicus	History of playing in the beach, 3 days back	With sterile needle, under magnification
Case 6	28 years	Male	Pain, swelling, redness	Scalp	The patient works in an area with dense vegetation nearby.	Tick was not in-situ at presentation. It was identified at the site of lesion from a video recorded by the patient
Case 7	2 years	Male	Pain, redness	Abdomen	History of tick bite in family – his mother and brother	Using an alcohol swab
Case 8	19 years	Male	Pain, burning sensation	Upper trunk	History of tick bite in family	Tick was not found in-situ.
Case 9	16 years	Male	Pain, redness, burning sensation	Near left axilla	No relevant history	Using a sterile needle under magnification



Figure 3: Dermoscopic image of the yellow tick with its mouth parts intact seen through dermoscope (DinoLite AM4113/AD 4113 series, polarized mode, x50)

with tick-infested vegetation also points toward other, rarer, possible modes of infestation. The manifestations caused by tick bites in humans are variable, with acute, non-specific lesions and late lesions that are, in the majority of cases, linked to infections.^[1] These manifestations have their own features and should be recognized by health teams because they can suggest the diagnosis of serious conditions.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The



Figure 4: Dermoscopic image of the black tick with its mouth parts intact seen through dermoscope (DinoLite AM4113/AD 4113 series, polarized mode, x50)

patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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