

Trombiculiasis: an underreported ectoparasitosis in Sicily

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SUMMARY

Trombiculiasis is a common but underreported ectoparasitosis characterized by an infestation of the skin by the larval stage of various species of mites belonging to the phylum Arthropoda, class Arachnida, subclass Acarina. Clinical manifestations consist of pruritic erythematous and urticarial macules and papules located on covered thin and glabrous skin. In recent studies *Neotrombicula autumnalis* larvae have been described as the possible vectors of pathogens such as *Borrelia burg-*

dorferi and *Anaplasma phagocytophilum*. Few reports of trombiculosis have been collected in the medical literature to date. We report a typical case of trombiculosis induced by trombiculid larvae of *N. autumnalis*, which are habitual parasites of various endo- and ectothermic vertebrates.

Keywords: trombiculiasis, ectoparasitosis, chigger mite dermatitis, mite.

INTRODUCTION

Trombiculosis is a common but underreported ectoparasitosis characterized by an infestation of the skin by the larval stage of various species of mites belonging to the phylum Arthropoda, class Arachnida, subclass Acarina. *Neotrombicula autumnalis* has been reported as the most frequent causative agent of human trombiculiasis in Europe although the actual extent of its presence in the old Continent has been recently questioned [1-4]. *Neotrombicula autumnalis* mites are more diffuse in the temperate and humid European environment, where adult individuals live and reproduce on the soil, especially during warmer and wet late summer months [5]. The clinical manifestations of trombiculosis or chigger dermatitis consist of pruritic, erythematous and/or urticated patches and papules, as well as, papulo-vesicles mainly located where the skin is thin and covered

by closely fitting clothing. Most lesions show a red puncture mark, and a few may bear attached red chiggers.

Since the clinical manifestations of chigger dermatitis are not usually so annoying to urge medical consultation, while - if not accurately examined - they may be confused with other forms of ectoparasitosis, the incidence of human trombiculosis is probably underestimated. In order to draw attention to this somewhat neglected infestation, we are reporting a typical case induced by chiggers of the genus *Neotrombicula*.

CASE REPORT

A 53-year-old man, living in Sicily, presented in the month of September with an intensely itching skin eruption, which had suddenly started a few days earlier, shortly after a hunting expedition in the backcountry. The eruption had been heralded by a tickling sensation. Physical examination showed several 3-4 mm large erythematous and urticated, maculo-papular lesions, marked by a red puncture spot or a small bloody crust on the

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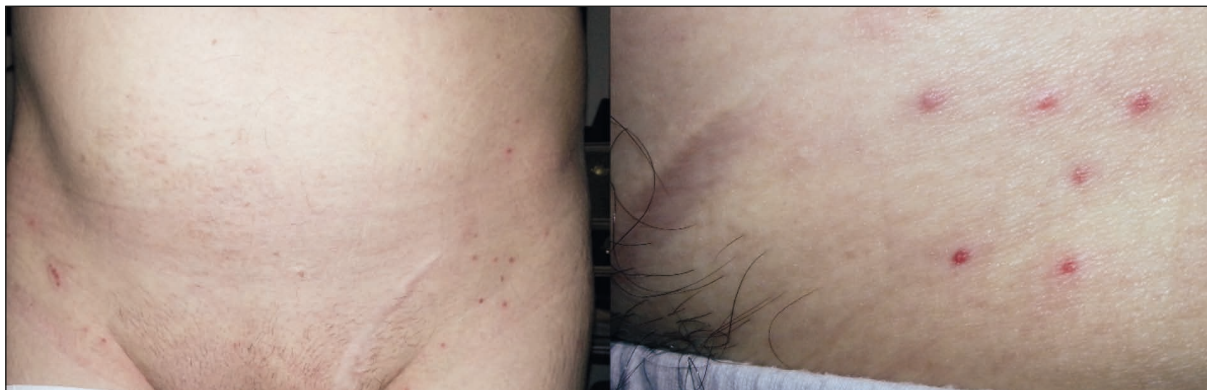


Figure 1 - Large erythematous urticated maculo-papular lesions.

top (Figure 1). In addition, clusters of minuscule, reddish corpuscles, hardly visible to the unaided eye, protruded from some lesions. A few excoriations were associated to the dermatitis, as a result of the intense itch and scratching. The lesions were mainly located on the waist, groins, pubes and ankles, and the itch persisted steadily during the day and night. The picture was generically indicative for a dermatitis from arthropod bites and the lesions were examined *in vivo* for details through a portable epiluminescence microscope (dermatoscope) with optional polarizing filter. Under the dermatoscope, the clusters of corpuscles resolved into groups of minute, attached and engorged, six legged larval mites, which were reddish in color and about 200 μm long (Figure 2). A few parasites were extracted from the lesions



Figure 2 - Parasites extracted from the lesions and classified as *Neotrombicula autumnalis*.

and referred to the Zooprophyllactic Institute of our town for identification. Here, they were classified as specimens of *Neotrombicula autumnalis*. The patient was treated with oral antihistamine, and topical application of permethrin, followed a twice daily application of antibiotics and steroids. The infestation ceased and trombiculosis healed in a few days.

■ DISCUSSION

Trombiculosis is a dermatitis caused by the attack of trombiculid larvae (chiggers) that are habitual parasites of various endo- and ectothermic vertebrates, when they accidentally try to feed on aberrant hosts, such as humans. The 150-300 μm long, six legged larvae represent the only parasitic stage in the life-cycle of these mites, while the eight legged deutonymph and adults live as predators of small arthropods and their eggs. Eggs usually hatch at the end of autumn. The other instars are inactive [5].

The family Trombiculae (Acari: Prostigmata: Trombiculoidea) includes numerous species, which share a remarkable capacity for adaptation to the environment. Thus, they thrive in regions with a wide variety of temperature, vegetation and pH of the soil and have been found in city areas, as well as in cultivated grain fields, in brush and grasslands, in forests and in creeks [6].

Chiggers cluster in ambush on pieces of vegetation and, once they clung to their host and found a suitable feeding site, they pierce the skin with their sharp mouthparts (chelicerae) and insert

chelicerae and hypostome in the wound. This is then sealed through the injection of a salivary secretion, which molds to the breach and rapidly solidifies, forming an eosinophilic cone, the stylostome, analogous, except for the size, to the much larger cone produced by the feeding of a tick. Meanwhile, tissue-dissolving saliva is forced through the stylostome to the tissue beyond its distal end, where the salivary enzymes cause the formation of a feeding cavity, containing digested material, dilated and leaky vessels, and blood. Like the tick cone, the stylostome cements the mite mouthparts to the wound and seals the feeding channel.

Around the stylostome necrotic epidermal cells and leucocytes lead to the formation of the large scabs on the surface of the host's skin. The stylostome is made from material of low antigenic activity that prevents the parasites from being rapidly removed from an immunological reaction of the host. The stylostome may extend backward around the mite to form a hyaline capsule [7]. Usually these capsule-forming chiggers are intra-dermal and may cause inflammation and edema. In some cases they induce formation of cysts leading to secondary infections [7-9].

In general, the larva remains in the selected place three to five days. During its stay on the host, due to abundant food intake, it grows by an average of about 0.25 mm to 0.75 mm and its very bright reddish-orange color becomes pale yellow. When it is fully satisfied, it drops to the ground where it continues its development into eight-legged nymphae and adult forms (2 mm) feeding upon small arthropods, their eggs or plant fluids.

Female adults deposit eggs in spring and summer so the larvae are particularly numerous in late summer and autumn but the human infestation is possible in other seasons of the year especially in those regions with temperate climate as Mediterranean Area.

The clinical manifestations by the bites of harvest mites are represented by our case which is a typical example of trombiculosis. They consist of pruritic erythematous and urticarial macules and papules, some of which marked by a red and small crust on top, located on covered thin and glabrous skin. Itching, inducing self-inflicted scratches, is severe but not unbearable and it does not worsen at night as in cases of scabies. Man is an occasional host for trombiculid parasites and

most cases occur in humans working in infested regions during last summer and autumn [3, 4].

The clinical features and the history are highly suggestive for the diagnosis and should prompt a search for the attached chiggers by dermatoscopic observation of the skin.

On the whole, trombiculosis has unique characteristic, which allow a differential diagnosis from other ectoparasitoses (scabies, pediculosis, phthiriasis, myiasis, tungiasis, cutaneous larva migrans, tick infestations) that require different therapeutic and prophylactic measures.

In recent studies *Neotrombicula autumnalis* larvae have been described as the possible vectors, via transstadial and transovarial routes, of pathogens as *Borrelia burgdorferi* causing Lyme disease and *Anaplasma phagocytophilum* (formerly *Ehrlichia phagocitophila*) responsible of human granulocytic anaplasmosis [10-12]. Moreover, based on some observation, human skin parasitism by harvest *Neotrombicula autumnalis* can be also considered a synanthropic disease as it is possible a way of transmission mediated by infested pets. So trombiculosis must be more greatly considered by physicians and veterinarians.

To prevent infestation, it is necessary the use of repellents on clothes and human and pet skin before going to areas that are considerably at risk for mite parasitism especially during the mouths of the larval cycle.

■ CONCLUSIONS

Trombiculidae, or chigger mites, parasitize a wide variety of vertebrates worldwide, including humans. Although they represent a well-known problem in animals, few reports have collected in medical literature to date. Physicians should pay attention to these emergent "synanthropic dermatoses" in the setting of seasonal infectious diseases typical of our countries. Concluding, we want to underline the importance of the collaboration among parasitologists, dermatologists and infectious diseases physicians, and the cooperation between human and veterinary field for these parasitosis.

Conflict of interest

Authors declare that they have no competing interest.

Consent

Written informed consent was obtained from the patient for publication of this case report.

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We have not received substantial contributions from non-authors.

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