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Chigger Bites

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Introduction

"Chigger" is the common name for species of the Trombiculid family of mites. Bites from the larva of these mites can cause local pruritus and irritation, formally known as trombiculiasis or trombiculosis. The reaction is usually mild and self-limited, but the bites may rarely transmit disease or result in a bacterial superinfection.[1]

While there are many species of parasitic mites in a variety of habitats all over the world, the species most commonly referred to as chiggers include *Eutrombicula alfreddugesi* in the south of the United States, *Trombicula autumnalis* in Europe, and species of the *Leptotrombidium* genus in Asia and Oceania. [2]The larvae of these species feed on the skin of a variety of animals, including humans. Adult mites burrow into the soil and feed on detritus while the larvae of these species accumulate on the edges of leaves and grass before hitching on to a passing host. They then migrate to a preferred feeding site, attach themselves to the host's skin, and secrete proteolytic enzymes to digest host epidermal cells. [3]This provokes an inflammatory reaction with surrounding erythema, a variable degree of swelling, and intense pruritus. They are easily dislodged by scratching. They rarely remain attached to humans for more than 48 hours, but the intense pruritus, inflammation, and localized allergic response may last for weeks afterward. Rarely, the light-red to orange colored larva, measuring 0.15 to 0.3 mm in length, may be identified on the skin. More typically, the diagnosis of trombiculiasis will depend on exposure to trombiculid habitat, the pattern of the lesions, and exclusion of other possible diagnoses. [1]

Etiology

Trombiculiasis is by definition caused by the bite of the trombiculid mite, and this requires exposure to the preferred habitat of larval mites. Once bitten, digestive enzymes secreted by the mite cause liquefaction of the host's epidermis, leading to a localized hypersensitivity reaction. This causes the papules, erythema, and urticaria that characterize the condition. [1][4]

Epidemiology

Larval mites mature to their parasitic stage between June and September in the Northern Hemisphere. Nearly all instances of trombiculiasis will thus occur in the summer and fall in patients of any age who have a history of exposure to the chigger habitat: overgrown fields, wooded areas, or ground with moist soil near bodies of water. Trombiculiasis has traditionally been associated with occupational exposure among harvest workers, but it can also occur in suburban or urban areas where the only outdoor exposure has been to a grassy field, an overgrown lawn, or a garden. In tropical areas worldwide, exposure may occur at any time of the year. [1]

Because the condition is usually benign and self-limited and not reported, the incidence in the general population is unknown.

Pathophysiology

As the larval mite liquefies epidermal cells, the skin around the bite will become edematous. This forms a papule around the mite, leading to the impression that the mite has buried into the skin. The mite can sometimes be seen on or within the papule, but will usually have become dislodged before the irritation begins. The pruritus usually resolves within a few days but may last for as long as 2 weeks. Bites are usually erythematous papules that may occur in

clusters, surrounding macules, vesicles and rarely, bullae may form later. Because the mites migrate on the host's body to a protected area with thin skin, they will often accumulate along the borders of tightly fitting clothing. Several bites in a linear pattern may occur along the waistband, the in-seam of underwear, or above the socks or shoes. [4]

History and Physical

Chigger bites can occur in any person exposed to the appropriate habitat during the summer months. Patients with occupational exposure will probably be familiar with chigger bites, but even working in a suburban yard, garden, or a casual walk in the park may expose a patient to trombiculid mites. A typical patient will present after a few days of intense itching with a grouped or linear pattern of papules on exposed skin or along a line next to tight-fitting clothes. The papules may develop surrounding dark red to violaceous macules, or they may develop into vesicles, or rarely into bullae. [2]

Male patients, particularly pediatric patients are susceptible to a localized hypersensitivity reaction involving the skin of the penis, termed summer penile syndrome or lion's mane penis. This involves edema of the penile skin or foreskin, is usually very itchy, and in a minority of patients may cause dysuria. [4]

Itching usually resolves without intervention after 2-3 days but may last as long as two weeks. [2]

Evaluation

No evaluation other than a thorough history and physical is necessary for the diagnosis or treatment of the trombiculiasis. As previously described, a history of outdoor exposure during the summer or early fall along with a pattern of scattered urticarial papules can establish the presumed trombiculiasis as the presumed diagnosis. [1]

Treatment / Management

Management and treatment are focused on symptom control with oral antihistamines or topical corticosteroid cream. Cold compresses may also help decrease discomfort and localized swelling. The best course of action for someone who is likely to be re-exposed to infested areas is to cover exposed skin, tuck the hem of pants into socks, and use DEET or permethrin repellents.

Mites can be easily dislodged through washing or scratching and have usually left the skin before the bite begins to itch.

There is no role for covering the bite in nail polish, vaseline, or cream intended to suffocate the parasite. [1][4]

Differential Diagnosis

The appearance of scattered papules along exposed skin or clustered around tightly fitted clothing after an outdoor exposure naturally suggests arthropod bites. Consideration should be given to scabies, bedbug bites, and exposure to mosquitoes or ants. The bites of fleas may sometimes also be in a linear pattern along tightly fitting clothing and should especially be considered if there are animals in the patient's home.

Rashes from many other infectious agents, autoimmune conditions, or sensitivity reactions may have a similar appearance. The history of outdoor exposure, the seasonal nature of symptoms, and the absence of recurrence are important to distinguish trombiculiasis from other causes of rash. Trombiculiasis should not be the presumed diagnosis in any ill-appearing patient, any patient with abnormal vital signs, any patient who has extensive vesicles or bullae, or whose lesions are painful instead of pruritic. [1][4]

Summer penile syndrome, as a particular and localized form of trombiculiasis, has its own differential diagnosis, including balanitis, phimosis, and paraphimosis. Balanitis is a painful inflammation of the glans penis, which may be associated with purulent exudate and erosion of the skin covering the glans. Phimosis is a constriction of the foreskin, preventing it from being fully retracted over the glans. Paraphimosis is a constriction of the foreskin in which the foreskin is stuck over the glans or shaft of the penis, restricting circulation to the glans. Both conditions may also be associated with penile swelling. In summer penile syndrome, the edematous skin should be minimally tender and should retract easily over the glans in uncircumcised males. Cellulitis and abscesses must be excluded as well. [5]

Prognosis

Trombiculiasis will resolve spontaneously within a few weeks as long as there is no re-exposure, and since the serious complications of a super-imposed bacterial infection or rickettsial disease are rare, the prognosis is almost invariably good. If there is there is a possibility of re-infection, the provider should counsel the patient on avoiding chigger habitat, covering the skin when passing through infested areas, or using repellents and insecticides to avoid exposure. [1][4]

Complications

Notable complications from trombiculiasis include cellulitis from excoriations, summer penile syndrome, and in parts of Asia and Oceania the transmission of a rickettsial disease called scrub typhus. The bacteria responsible for scrub typhus, *Orientia tsutsugamushi,* causes fever, headaches, myalgias, rashes, and sometimes eschar formation at the site of the bite. The disease is endemic from Pakistan to the Korean peninsula and Australia. Symptoms last for a few weeks, and if untreated, can result in multi-organ failure and death. The disease can be treated with doxycycline. [6]

Deterrence and Patient Education

Avoiding areas of chigger infestation is the easiest way to prevent trombiculiasis. If exposure is unavoidable, patients can be advised to use elastic bands to close the hems of sleeves and pant legs tightly against the skin, to cover the skin completely, or to tuck the hems of their pants into socks or boots. DEET repellent and permethrin are also effective deterrents of chigger bites. [1][4]

Pearls and Other Issues

- Chigger bites occur during summer and early fall in those with a recent outdoor exposure.
- Patients display pruritic papules, sometimes clustered around tightly fitting clothes.
- Itching usually lasts for a few days, sometimes as long as two weeks.
- Lesions can sometimes form vesicles or rarely bullae, and may have surrounding violaceous macules
- Treatment is usually restricted to oral antihistamines, cold compresses, and topical corticosteroids.
- Prevention in those with recurrent exposure can be achieved by completely covering the skin, or using DEET or permethrin.
- Notable complications include secondary cellulitis, summer penile syndrome, and in parts of Asia and Oceania, the rickettsial disease scrub typhus.

Enhancing Healthcare Team Outcomes

Trombiculiasis is easy to diagnose in the right clinical scenario, but may the condition may be unfamiliar to physicians who have never lived in endemic areas. Other members of the interprofessional care team should feel free to suggest a diagnosis to ensure that patients can be treated appropriately.

All members of the health-care team are motivated by trying to achieve the best outcome for patients. Diagnostic anchoring on the diagnosis of trombiculiasis should not deter physicians, nurses, and pharmacists from considering potentially life-threatening cellulitis and underlying abscesses that may accompany chigger bites. All members of the health care team should also take care to avoid harm caused by treatment, in this case, the potential overuse of steroid cream for long-lasting irritation. Steroid creams are more effective on the thin skin of the genitalia and may be more likely to cause adverse outcomes if used to treat summer penile syndrome. [1][4]

Continuing Education / Review Questions

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References

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Figures

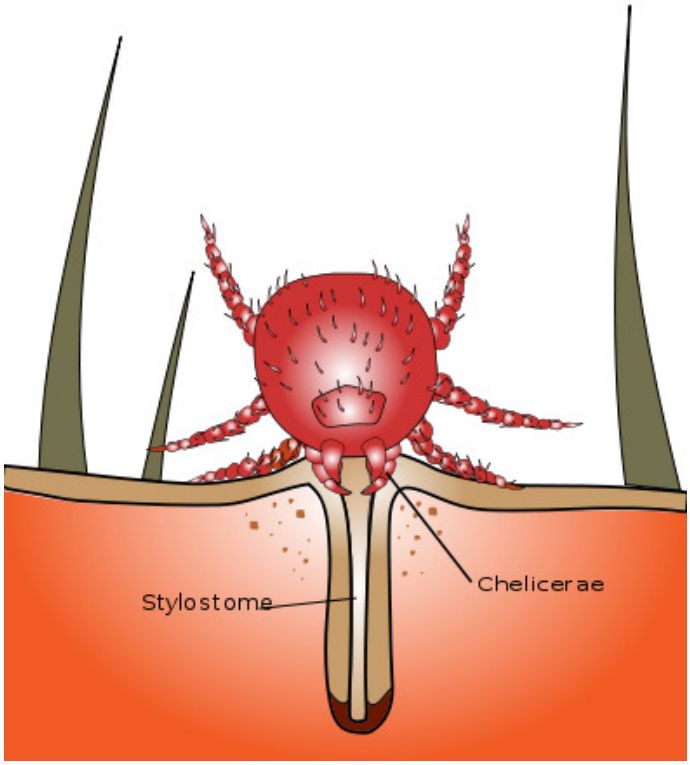
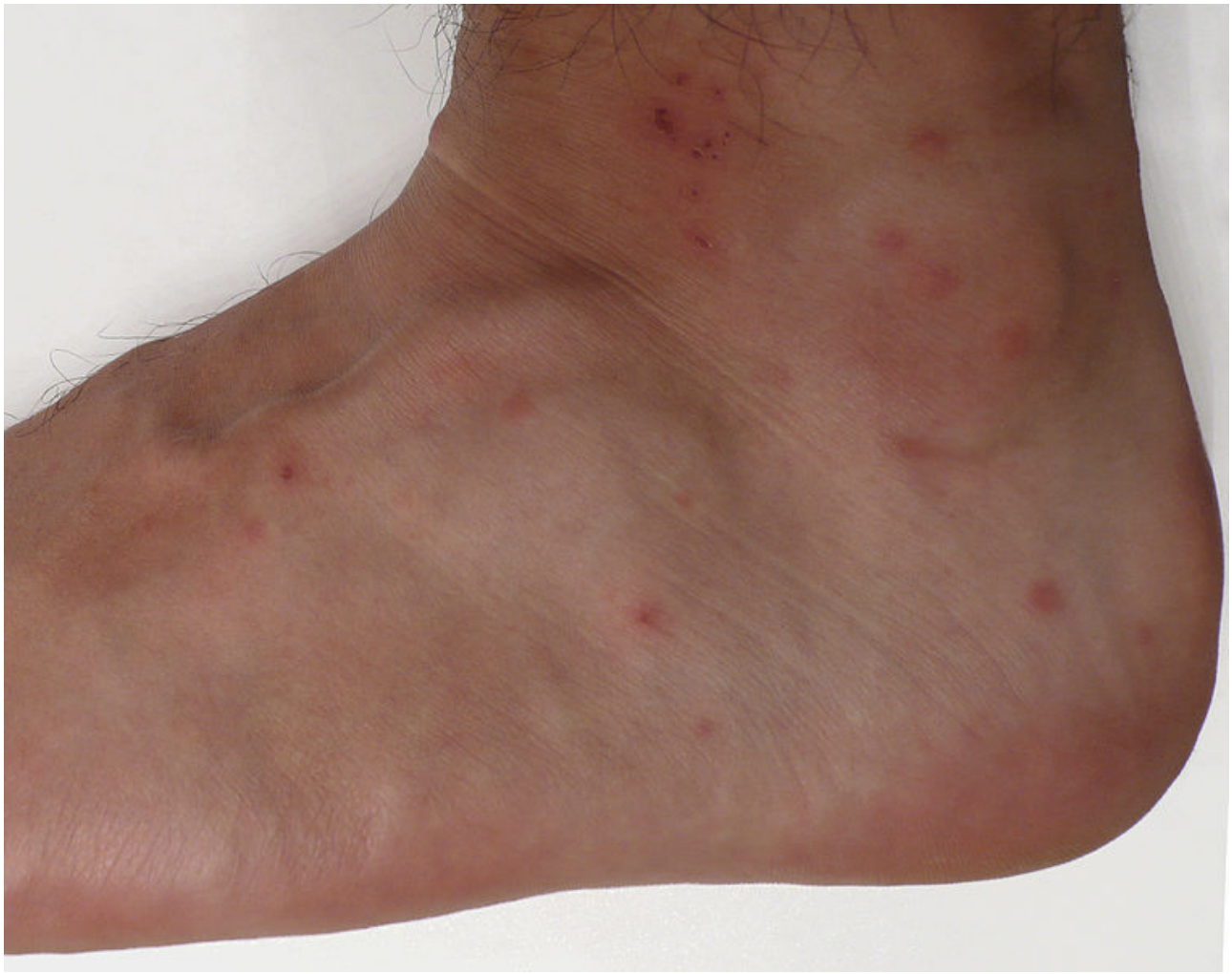
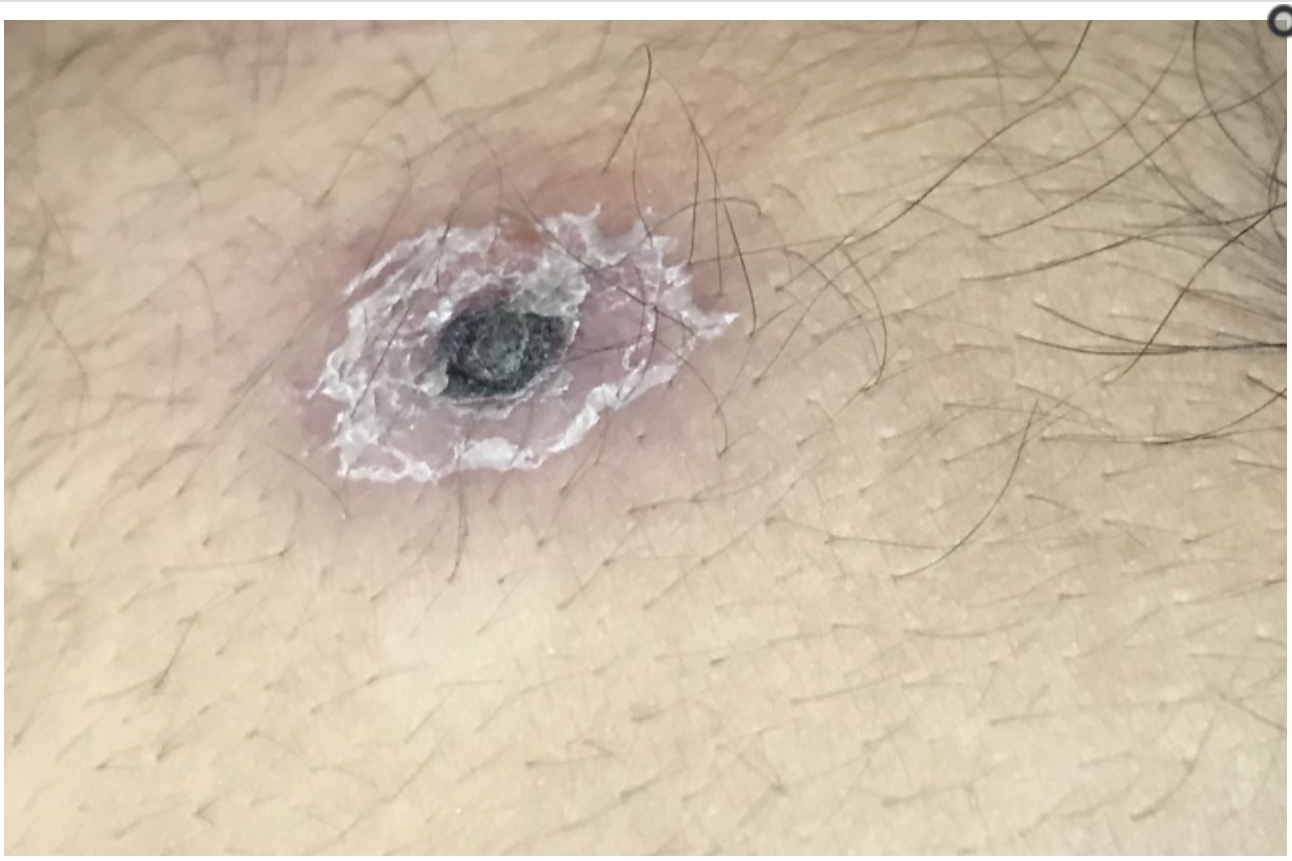


Image of the use of a stylostome during chigger feeding. Image in public domain https://commons.wikimedia.org /wiki/File:File-Chigger_bite.svg



Dermatological findings from multiple chigger bites. Image in public domain https://commons.wikimedia.org /wiki/File:Chigger_bites.jpg



Eschar over the right chest produced after the bite of a chigger in a farmer. Contributed by Prasan K Panda, MD

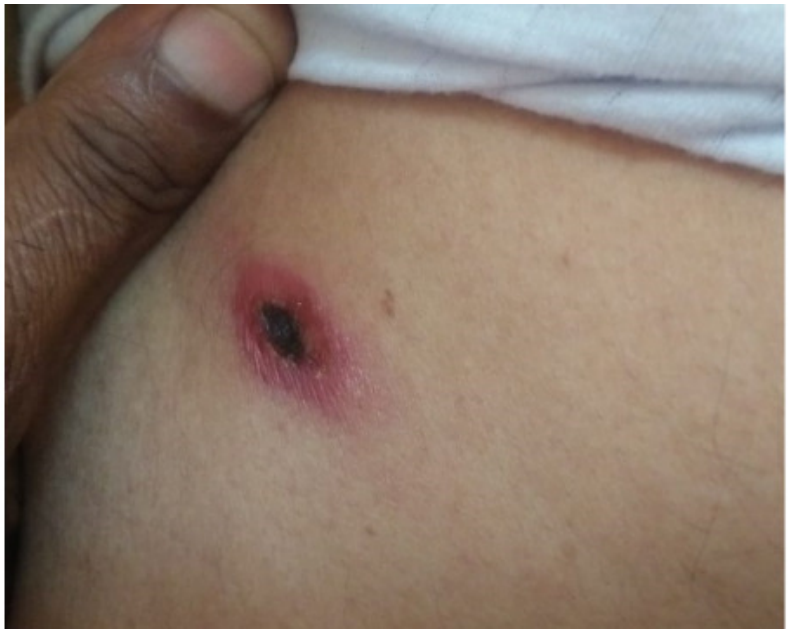


Fig 1: Eschar over the right chest produced after the bite of a chigger in a farmer. Contributed by PK Panda, MD

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