



Tungiasis in the Peruvian Aborigines

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Abstract

The authors describe some historical data that demonstrate the existence of tungiasis among the aborigines since Pre-Inca times; and they present some ceramics from ancient Peruvian cultures that testify to presence of this disease.

Likewise, they briefly describe the lesions produced by this ectoparasitosis and the way in which it was treated.

Keywords: Tungiasis; Tunga or Chigger; Peruvians Aborigines; Injuries and Treatment

Tungiasis, ectoparasitosis that affects the skin, especially the feet (95%), has been closely related to the American aborigine, where it is from. The causative agent of this evil is the tunga (Tunga penetrans), also called chigger, pique, sand flea, burrowing flea, among other designations.

The female of the fertilized chigger is introduced under the skin of the feet since these are usually exposed in people who do not wear shoes or because the chigger can not jump very high. Jump maximum 20 cm [1].

The most affected areas of the feet are: periungual, interdigital folds and soles of the feet. In 5% of cases, legs, knees, thighs, elbows, breasts, neck, face, eyelids, buttocks, groin, anus or genitals can also be affected.

Tungiasis produces lesions that can be single or multiple, pruritic, painful or asymptomatic. The phenomenon of penetration is asymptomatic. In the first 24 hours after penetration, an erythematous, pruritic macula or papule is observed at the site of the invasion, evolving into whitish nodules with a black dot in the center, which corresponds to the back of the chigger abdomen. After the death of the chigger, the lesion is covered with a black crust formed by coagulated blood, detritus and involutes leaving an epidermal scar (V stage).

Although tungiasis tends to resolve spontaneously within 4 to 6 weeks, reinfestation is the norm. Occasionally, the host may be infested with hundreds of chiggers giving a honeycomb appearance, this considerably limits their ability to roam.

The conventional treatment is the surgical removal of the chigger and lesions with sterile technique. If the case merits it, antibiotics should be administered systemically and in all cases tetanus prophylaxis should be indicated [2].

The earliest evidence of parasitization by chiggers (tungiasis), appears in ceramics from Pachacamac in Peru, which personify an aboriginal removing chiggers from the foot, scratching the lesions of the soles of the feet or simply showing the lesions.

In 1526, the Spanish chronicler Gonzalo Fernández de Oviedo [3], not only related the characteristics of the chigger, but also the damage it caused to the Spanish conquerors when they were in Haiti, a country that together with the Dominican Republic form the Island of Hispaniola. He also tells us about the healing methods they used. The chronicler describes the following: "In this island and in all these Indies there is the evil they call chiggers. The chigger is a very small living thing, much smaller than the smallest flea you can see. But anyway it is flea gender, because just like she jumps, only it is smaller. This animal walks in the dust, wherever you would like there not to be, be swept often the house. They enter the feet and other parts of the person, and especially most of the time on the heads of the fingers. Many lost their feet because of these chiggers, or at least some of their toes, because afterwards they festered and made matter, and it was necessary to cure themselves with iron or fire. But this is easy to remedy quickly, taking them out at the beginning" [3].

In 1534, the hosts of Gonzalo Jiménez de Quesada on their way to Bogotá suffered from tungiasis when they landed in a village abandoned by locals who had fled for fear of the Spanish. Who tells us this fact is Lucas Fernández de Piedrahita [4] in his work "Historia general del nuevo reino de Granada".

"Considering, therefore, the good temper of the site, abundance of provisions, fodder and grain for the horses, General Quesada agreed to stop there four days, which were very costly to his soldiers, because wanting to march at the end of them, they were prevented from the feet of such a way that they could not move, because in those places a genus of fleas somewhat smaller than these of Spain are bred, which enter the flesh, especially in the toes by the part that the nails meet, where they grow to become some as large as small chickpeas, causing pain and insufferable stinging all

the time it stops there, which originates making it impossible for men to walk until they take them out. And as the mourners were ignorant of the plague, they did not know how to apply the remedy being so easy, until some barbarian women of those who in those populations found, understood their ailment by signs, ate to remove them with the tips of the moles, not without great pain of the most achacosos; but the penalty served from then on to enter the houses guarded and trimmed with shoes and stockings, which defended the entrance of the chiggers, as they call them" [4].

Francisco López de Gómara [5], chaplain and personal secretary of Hernán Cortés, who was in the Conquest of Mexico and Central America, describes the chigger and the damage they caused to the Spanish guests: "The chigger is like a tiny flea, jumping and friend of dust; nor itches but on the feet; gets between body and flesh; Then stop their nits in greater quantity than they have, which soon beget others and, if they leave them, multiply so much that they can not exhaust and remedy them except with fire or iron. The remedy for not itching is to sleep with bare feet or covered. Some Spaniards lost their toes and others lost their entire feet" [5].

In 1595, the Italian Francesco Carletti [6], in his work "Razonamientos de mi viaje alrededor del mundo (1594 - 1606)", mentions the existence of tungiasis in Peru, the discomfort it caused and the way it was treated; emphasizing that the best healing method was to surgically remove the chiggers without breaking them since more eggs are propagated and more chiggers grow. He refers to all this when he tells us that the dry climate of Lima caused: "A certain class of little animals that are engendered in the rooms of the houses like fleas and jump like those, although otherwise they are in the form of worms, which getting between the nails and the flesh of the toes enter little by little, gnawing on that flesh like a moth in the wood and there they thicken with such luck, that many times they make a sore that makes them lose the toes of these feet without being able to perceive them, but after the evil is done, which is incurable, and this happens because when they enter they are so small and make so little hole that it is barely seen, and neither is it felt. Animals that are called chigger or pique and especially offend those who go barefoot, and to get rid of them it is necessary, realizing this, to take care to remove these animals diligently from the fingers or where they are, seeing that they do not break, because if they do not spread in the sore a quantity of eggs, of which so many

are regenerated that it is not possible to extinguish the semen later, but extracting it whole and without breaking it heals easily, if then a little ink is put inside the hole, which is customary to medicate [6].

The Ayacucho chronicler Guamán Poma de Ayala [7], in his work “New chronicle and good government”, in chapter I, when dealing with the miracles of God, narrates the following: “It is also said miracle of God and punishment and pestilence of the mice in the plains and of doing a lot of damage to the birds in the seedbeds throughout the mountain range of the North Sea, as many people died of hunger and pestilence of mosquitoes and flies, lice fleas, pique, niua”.

Bernabé Cobo [8], Spanish chronicler, reports that the chigger was a habitual host of the bare feet or poorly protected by light woolen sandals of the Peruvian aborigines. Cobo also tells us that to calm the itching produced by the chigger or to kill it, the aborigines applied Apichu leaf plaster on the affected areas or areas.

Likewise, it is important to mention that Dr. Maco., *et al.* [9], studied written sources of the conquest of America and ceramic pieces of ancient Peruvian cultures, managing to identify 17 written documents and four pieces of ceramics, three of the Chimú culture and one, that they have discovered of the Maranga culture, which give faithful testimony that tungiasis existed in America and Peru since pre-Columbian times.

As a corollary, it should be stated that the Peruvian aborigines suffered from tungiasis. While it is true that tungiasis is generally not fatal – unless a bacterial superinfection is added – it is also true that it is a fastidious, overwhelming and martyring disease that can disfigure and mutilate part of the feet. Hence the need for aborigines to combat it effectively, either with medicines obtained from nature or by surgical removal of chiggers.



Figure 1: Individual showing skin lesions (punch type) of the sole of the foot caused by chiggers. Chimú Ceramics – American Museum of Natural History in New York (MAHNNY), USA.



Figure 2: Individual scratching lesions (punch type) of the sole of the left foot caused by chiggers. Chimú Ceramics – MAHNNY, USA. SA.



Figure 3: Individual scratching the lesions of the sole of the right foot caused by chiggers. Inca Ceramics – National Museum of Archaeology, Anthropology and History of Peru (MNAHP), Lima.



Figure 5: Individual showing lesions of the sole of the right foot caused by chiggers. Inca Ceramics- National Museum/Federal University of Rio de Janeiro, Brazil. License: Creative Commons Attribution-Share Alike.



Figure 4: Individual with skin lesions on the sole of the left foot caused by chiggers. With his right hand he wields an awl ready to extract the chiggers from his left foot. Chimú Ceramics – Source: Julio C. Tello *Journal of Inca Anthropological Studies*, Vol II, 1938.



Figure 6: Fragment of a ceramic representing an individual extracting from the left heel with an awl (black color). The individual has tattoos on his forearm and left leg. Maranga Ceramics - Source: Maco V, Tantaleán M, Gotuzzo E: Evidence of tungiasis in pre-Hispanic America. *Emerg Infect Dis*. <http://dx.doi.org/10.3201/eid1705.100542>.

Summary

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They also briefly describe the lesions produced by this ectoparasitosis and how it was treated.

Palabras clave: tungiasis; tunga or chigger; Peruvian aborigines; injuries and treatment.

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