

Imported tungiasis: case report

Tungíase importada: relato de caso

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Abstract

Tungiasis is a skin parasitosis caused by a flea. It is very prevalent in underdeveloped countries and rare in developed countries, particularly in Europe. The disease is acquired through direct contact with infected soil, mainly on the feet after the host has been barefoot. The disease is typically self-limited and its diagnosis is essentially clinical due to its typical clinical presentation. This report presents a case of imported tungiasis in Portugal, in a 21-year-old male patient after returning from a vacation in a country with a high prevalence of this parasite. The patient had three typical tungiasis lesions, with no associated complications. The parasites were surgically excised without complications. The aim of this report is to contribute to knowledge of this pathology, which is largely unknown to the majority of the medical community. Its identification is essential due to the increase in globalization, tourism, and the importation of this pathology.

Keywords: Tungiasis. Skin disease. Sand flea. *Tunga penetrans*. Case report.

Resumo

A tungíase é uma parasitose cutânea causada por uma pulga, sendo prevalente em países subdesenvolvidos, sendo rara a sua apresentação em países desenvolvidos, nomeadamente na Europa. A doença é adquirida através contacto direto com o solo infestado, sendo adquirida principalmente nos pés após o hospedeiro ter andado descalço. A doença é tipicamente autolimitada e o seu diagnóstico é essencialmente clínico devido à sua apresentação clínica típica. Neste relato apresenta-se um caso de importação de tungíase em Portugal num utente masculino de 21 anos após regressar de férias num país com alta prevalência deste parasita. O utente apresentava três lesões típicas de tungíase, sem complicações associadas. Foi realizada a excisão cirúrgica dos parasitas sem intercorrências. Com este relato pretende-se contribuir para o conhecimento desta patologia muito desconhecida pela maioria da comunidade médica, sendo essencial a sua identificação devido ao aumento da globalização, do turismo e da importação desta patologia.

Palavras-chave: Tungíase. Doença cutânea. Pulga da areia. *Tunga penetrans*. Relato de caso.

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Received: 24-10-2023

Accepted: 10-12-2023

DOI: 10.24875/PJDV.23000087

Available online: 26-01-2024

Port J Dermatol and Venereol. 2024;82(2):138-141

www.portuguesejournalofdermatology.com

Introduction

Tungiasis is a parasitic skin infection caused by the female sand flea *Tunga penetrans*, when it comes into contact with the skin and penetrates it¹. This parasitosis is endemic to tropical and subtropical areas, typically in underdeveloped countries². This disease is known by various names across the globe: *chigoe*, *jigger*, *sand flea*, *puce-chique*, *kuti*, *suthi pique*, *niguas*, *bicho do pé* or *pulga de bicho*³. Although it is not present in Europe, it is possible to observe this pathology in tourists, especially those staying in more rural areas and in local accommodations⁴.

The following case has the purpose to illustrate a disease that is not so well known in the European medical community but that needs better recognition due to globalization, easy access to travel, and close relations with certain communities^{3,4}.

Clinical case

A 21-year-old man, caucasian, living in Portugal, with no previous medical or surgical history, no medication, and no documented allergies, with an up-to-date vaccination plan, was observed in the acute illness consultation at his primary health-care center with three pruritic skin lesions on his toes beginning the previous week, with a foreign body sensation and discomfort when walking, but no pain or any other symptoms or previous injuries. The patient reported having spent 2 weeks on vacation in Brazil, in a rural area, having been barefoot on the beach and the land near his accommodation.

Inspection revealed three firms isolated 5 mm papules, bright yellow with a black central region, on the 1st and 4th toes of the left foot and the infra-ungual region of the 3rd toe of the right foot (Figs. 1-3). Lesions showed no signs of surrounding inflammation and no other lesions could be observed.

Based on the description of the lesions, symptoms, and recent trip to Brazil, the first diagnostic hypothesis was tungiasis. The patient was referred to the emergency department of the nearest hospital where the three parasites were extracted and the locae were debrided. Within 2 weeks, there was a complete recovery.

Discussion

Tungiasis is a parasitic disease endemic to tropical and subtropical areas, typically found in underdeveloped countries, particularly in sub-Saharan Africa,

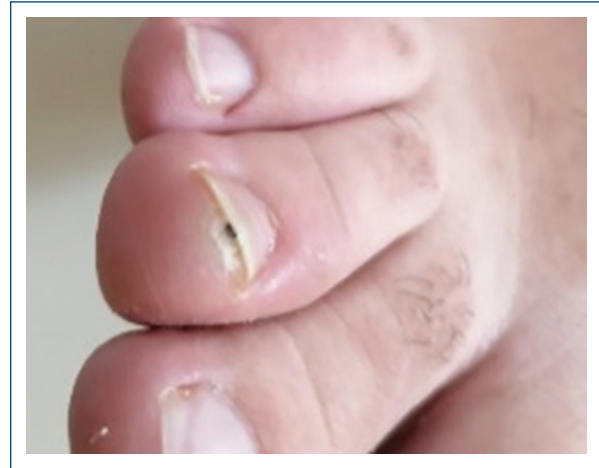


Figure 1. Infra-ungual tungiasis lesion, 3rd toe of the left foot.



Figure 2. Tungiasis lesion on the external lateral surface of the 4th toe of the right foot.



Figure 3. Tungiasis lesion on the external surface of the 1st toe of the right foot.

South America, and the Caribbean^{2,5}. This parasitosis is more prevalent in more populated places, with poor sanitary and housing conditions and with reservoir animals present (rats, cats, cows, pigs, and dogs)⁶⁻⁸. The parasite is found in sandy soil and beach sand and is transmitted through direct contact.

The parasite begins its life cycle after hatching from an egg in the form of a larva that feeds on organic compounds in the environment. After growing, the larva pupates and becomes an adult flea. The adult male and female fleas feed intermittently on the blood of their hosts, but only the pregnant female flea is able to penetrate the host, which is essential for the parasite's life cycle. The pregnant flea penetrates the skin through its cephalic portion, leaving the terminal portion in contact with the outside that allows the flea to breathe and expel feces and white eggs, and gives the skin lesions a black color in the center that contributes to the clinical identification. After 5-6 weeks, the flea dies and is expelled by the host after several weeks^{9,10}.

Tungiasis differs in terms of epidemiology, clinical presentation, and complications between tourists and inhabitants of endemic regions: in tourists, the disease is typically benign and self-limited, whereas in endemic areas, the disease can be very disabling due to the longer exposure time and number of parasites². In tourists, due to the penetration of isolated fleas, the disease usually presents as isolated papular or nodular lesions with white, gray, or yellowish color, surrounded by hyperkeratosis, and a small brown-to-black central opening, sometimes with eggs on the adjacent skin, corresponding to the posterior portions of the abdomen of the flea^{4,11}. The lesions may be associated with itching, pain, skin desquamation, and foreign body sensation^{6,8}. Typically, lesions occur on the feet (due to walking barefoot), typically on the toes, the interdigital region, and the infra-ungual region, but lesions may also be present on other parts of the body, such as the hands or back, if the person sleeps on the floor. In individuals living in endemic countries or in immunocompromised patients, lesions can be found in aggregate forms with up to 30 parasites in the same area, causing deformation of the adjacent skin, more often with hyperkeratosis, deformation of the extremities, bacterial over-infection, and gangrene^{1,2,4,7,9}. In addition, other less common clinical presentations have been described, such as plantar wart-like lesions, crusted, bullous, pustular, and ulcerative lesions¹¹.

The diagnosis of tungiasis is made clinically, based on the presence of typical lesions together with a corresponding travel history to an area where tungiasis is

endemic¹¹. Dermatoscopy has been shown to be helpful to aid the diagnosis of tungiasis, particularly in non-endemic regions^{4,6,11,12}. The classical characteristics are a brown-to-black central pore, a white halo corresponding to the enlarged abdomen of the parasite, and a peripheral bluish-gray area corresponding to the parasite exoskeleton⁴. Confirmation of the diagnosis is made with microscopic analysis, which shows hyperkeratosis, parakeratosis, and acanthosis^{2,11}. The flea is localized in the upper dermis, surrounded by a pseudo-cystic cavity. Eggs are also observed inside the flea. A perilesional, inflammatory infiltrate, is also present¹¹.

The differential diagnosis of tungiasis may include viral warts, cutaneous myiasis, granuloma of foreign bodies, arthropod bites, ingrown foot nails, bacterial infections, pyogenic granuloma, malign tumors (melanoma and squamous cell carcinoma), and myxoid cysts^{3,4,5,6,9,11}.

Treatment of choice is complete surgical excision of the parasite, with subsequent disinfection of the site^{2,4,9}. Antibiotic therapy is not necessary unless there are signs of bacterial over-infection^{2,4}. Vaccination status against tetanus should be checked and updated and prophylaxis may be necessary^{2,3,4,11}. However, the surgical option is not recommended in severe infections with the presence of several parasites. There is still no topical or oral treatment with satisfactory results for tungiasis, but some studies report on the use of ivermectin and thiabendazole, especially topical^{2,9,10,11}.

Prevention consists mainly of avoiding contact with contaminated soil, wearing closed shoes when in contact with soil and sand, and regular inspection of the feet for early identification of skin lesions^{4,10}. In addition, some studies indicate the use of a plant-based repellent Zanzarin[®] (made up of coconut oil, jojoba oil, and aloe vera) to reduce the number of lesions^{2,9,10,13}. Regular decontamination, implementation and improvement of sanitary measures, and the removal of parasite reservoir animals can reduce prevalence.

We present this case to emphasize the existence of this tropical disease, which is not so well known in the medical community in non-endemic countries¹⁴, but whose recognition is important, given the increase in globalization, tourism, and social migration phenomena.

Funding

None.

Conflicts of interest

None.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

Use of artificial intelligence to generate texts. The authors declare that they did not use any type of generative artificial intelligence in writing this manuscript, nor to create figures, graphs, tables, and/or their respective captions.

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