

Case Report

Tungiasis infestation in Tanzania

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Abstract

Tungiasis is caused by the jigger flea *Tunga penetrans*. We describe a case of severe infestation from Kigoma region, Western Tanzania. A 19-year-old male with epilepsy and mental disability presented with ulcerated and inflamed toes. Clinical examination revealed the presence of approximately 810 embedded jigger fleas on the feet, and another 60 lesions on the hands. The patient presented with fissures on the feet, hands and soles. He had difficulty walking and erythematous, oedematous, ulcerated and inflamed skin around the feet. Living conditions were precarious. The patient was assisted to extract the embedded fleas and his feet were washed with disinfectants. Oral antibiotics were given. The case shows that the disease may reach high parasite loads in Tanzanian individuals, with consequently severe pathology. There have been single reports of returning tourists from Tanzania with tungiasis, but the epidemiological situation and the geographic occurrence of the disease in this country are not known. Systematic studies are needed to increase knowledge on the epidemiological situation of tungiasis in Tanzania and to identify endemic areas.

Key words: Tungiasis; *Tunga penetrans*; Tanzania; Africa

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Introduction

Tungiasis is a parasitic condition affecting the skin. The ectoparasitic disease is caused by penetration of the jigger flea *Tunga penetrans*. For many centuries, the parasite was native to Latin America and the Caribbean, but from there it spread to sub-Saharan Africa in the 19th century [1]. Since then, tungiasis continues to be an endemic health problem in countries stricken by poverty and deprivation not only on the American, but also on the African continent [1-3]. *Tunga penetrans* infestations may cause severe disease resulting in deformation of digits, chronic lymphedema, ulceration, secondary bacterial infections and tetanus [1,4,5].

Case report

During a pilot survey to identify communities affected by tungiasis in Kasulu district, Kigoma region (western Tanzania), we found a 19-year-old male living in the small village of Zeze (population about 4,000). The village, which is located in Rusesa ward, is comprised of poor communities lacking

appropriate urban services such as electricity, water supply, and health facilities. Houses are located on relatively large compounds, and most houses are roofed with grass materials and palm stems. Inhabitants cultivate maize, cassava, bananas, beans, groundnuts, and coffee. The area has two main rainy seasons that run from November to December and February to May with the mean annual rainfall of 1,100 mm. The annual minimum and maximum temperatures for the area are between 17°C and 31°C.

The patients' toes were ulcerated and inflamed with numerous black-and-white dots (Figure 1). According to our observations and those of community members, tungiasis was highly endemic in this village, and the diagnosis of *Tunga penetrans* was made.

Detailed clinical examination revealed approximately 810 embedded sand fleas, 750 (92.6%) on the feet (400 on the right and 350 on the left foot). In addition, another 60 lesions were evident on the hands. According to the Fortaleza Classification [6], 660 (81.5%) lesions were in vital

Figure 1. Right foot. All toes are infested by *Tunga penetrans*. Toes are inflamed and nails are deformed.



stage, and 150 (18.5%) avital. The patient presented with fissures on the feet, hands and soles. He had difficulty walking and erythematous, oedematous, ulcerated and inflamed skin around the feet, ankles, and toes. Itching was present. Black crusts were surrounded by necrotic tissue and active lesions. A bad smell and discharges were evident, suggesting the presence of secondary bacterial infections.

The patient's living conditions were precarious: the walls of the grass-roofed house were made with tree poles and mud. Inside the house, much garbage was scattered on the dusty floor. His sister disclosed that he suffered from epilepsy and mental disability and spent most of his afternoon time resting under a tree because of difficulty walking. At night, he usually slept on a traditional bed. The patient did not have access to either education or health care.

The patient was assisted to extract the embedded fleas and his feet were washed with disinfectant (Dettol^R, a commercially available disinfectant), and oral antibiotics were given (500 mg Cloxacillin three times a day for five days). His family was instructed to take care of him by extracting all the embedded fleas using sterile needles and taking him to hospital for tetanus vaccination. Other family members observed to be infested were advised to extract embedded fleas using boiled sewing needles and pins to reduce risk of transmission of diseases such as HIV/AIDS. Parents were advised to keep checking their own and their children's feet daily and to remove immediately any embedded fleas.

Discussion

Tungiasis is common in sub-Saharan Africa. It is believed to have reached Tanzania in the late 19th

century during the travels of Sir Henry Morton Stanley and other adventurers, from Western parts of Africa to the East [1,7,8]. In modern times, tungiasis has been reported from Tanzania repeatedly in travellers who had visited endemic foci and seems to occur commonly in this country [9-12]. There is also a report of the disease from Australia in Tanzanian refugees [13], but cases reported involved a low number of lesions, and no systematic data are available about the epidemiological situation and the geographical patterns of occurrence inside the country. A historical report from Tanzania described severe tungiasis in pigs [14]. Recently, Kilonzo *et al.* (2006) identified *Tunga penetrans* fleas inside dwellings in northern Tanzania [15].

To raise awareness of human tungiasis in Tanzania, we present an endemic case of human tungiasis autochthonous with severe infestation. The report indicates that, similar to recent accounts from other African countries such as Nigeria [2,16], Madagascar [17] and Cameroon [18,19], the disease may also reach high parasite loads in individuals in Tanzania, with consequently severe pathology, in contrast to milder cases reported by returning tourists.

Figure 2. Right foot. All toes are infested by *Tunga penetrans*. Toes are inflamed and nails are deformed.



The patient was living under conditions previously described as risk factors in studies from Brazil and Nigeria [20,21]: *i.e.*, people living under poor conditions, usually in houses with floors made of sand or mud. The type of soil in the area is red clay soil which gives much dust during the dry season. Climatic conditions in our case were similar to these previous studies. In addition, people keep animals such as cattle, goats, pigs, dogs and cats that have been described as important animal reservoirs for *T. penetrans* [22-24].

In conclusion, the present case shows that tungiasis may cause severe disease and deformation in high-risk individuals living under precarious conditions in Tanzania. Tungiasis needs to be considered as a public health problem in poor communities in endemic areas. Action is needed to reduce severe morbidity caused by this parasitic skin in African communities [3]. Future studies are needed to increase knowledge on the epidemiological situation in Tanzania, to identify particular socio-cultural, behavioral, biological and ecological risk factors, and to identify endemic areas in this country.

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