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A 4-Year-Old Girl from Bolivia With a Dark Nodule on Her Toe

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Clinical Presentation

History

A 4-year-old girl presents with a history of several days of a slowly growing nodule on the fifth toe of her right foot that is moderately painful when wearing shoes. The family moved from Chile to the Cochabamba region in Bolivia about 6 months ago, where they live on a farm. Her 9-year-old brother has similar lesions on two toes.

Clinical Findings

4-year-old girl in good general health. Close to the root of the fifth toenail of the right foot there is a dark-brown small nodule with a tiny central ulceration, surrounded by minimal inflammatory reaction (Fig. 65.1). The parents report that when they had tried to squeeze the lesion, they observed white oval granules emerging from the nodule.

Questions

1. How would you diagnose this disease?
2. How would you treat the patient?

Discussion

A 4-year-old girl who lives on a farm in Bolivia presents with a slowly growing nodular lesion on her toe. Her brother has similar lesions on his feet.

Answer to Question 1

How Would You Diagnose This Disease?

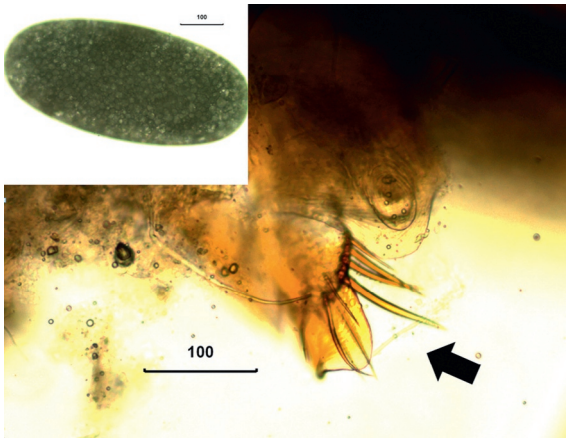
The macroscopic presentation and localization of this lesion allows the clinical diagnosis of tungiasis. Physicians who are not familiar with the disease might send a sample for microscopic confirmation. Fig. 65.2 shows parts of the parasite and an egg in a tissue sample. The female flea is usually destroyed during the process of removal, but parts of the body as well as eggs can still be found.

Answer to Question 2

How Would You Treat the Patient?

The parasite should be completely removed using a sterile needle and/or curette. The resulting round lesion must be disinfected and dressed. The patient's tetanus vaccination

• **Fig. 65.1** Small nodule on the fifth toe of right foot. (Toenails with leftovers of glitter nail polish.)



• **Fig. 65.2** Microscopic examination of removed tissue containing parts of female flea (arrow) and typical eggs (size 600 × 280 μm).

status should be checked and the wound should be observed; and if necessary, treated for superinfection.

The Case Continued…

The skin lesion healed within a week without complications.

SUMMARY BOX

Tungiasis

Tungiasis is caused by the female *Tunga penetrans* (syn. sand flea, jigger, bicho do pé), which burrows into the epidermis of humans and various animals before oviposition. There, the parasite engorges to a size of approximately 1 cm, causing a slowly growing nodular skin lesion. The flea is completely embedded into the skin, except for the tip of the posterior end, through which the respiration, defecation and oviposition occurs.

Typical localizations are the periungual regions of the feet, interdigital spaces and soles. However, other parts of the body might be affected after contact with contaminated soil.

Clinically, the flea together with the surrounding inflammatory reaction initially presents as a pale nodule with a dark centre; later the lesion might turn brown with a dark scab. It often causes local itching or pain. Symptoms are usually mild in patients visiting endemic areas and start after several days in cases of first infestation. Individuals living in endemic regions may suffer massive and repeated infestations leading to superinfection with complications such as gangrene, bacteraemia or tetanus.

The parasite is endemic in Latin America from Mexico to northern Argentina and the Caribbean. From there it was introduced into sub-Saharan Africa, probably around 150 years ago. Tungiasis belongs to the category of neglected and poverty-related infectious disease. In poor communities of endemic countries, constant re-infection causes severe morbidity including deformation and permanent disability. Important zoonotic reservoirs for human infections include pigs, dogs and rats. In travellers, tungiasis is found in about 1% of those presenting with dermatological problems.

The diagnosis is usually based on the clinical presentation. In non-endemic regions, the parasite and its eggs may be demonstrated in tissue samples and histopathological sections. Treatment consists of removing the flea with a sterile needle or curette with or without local anaesthesia, disinfection and prevention or treatment of concomitant bacterial infections.

To prevent the disease, contact with contaminated sand or soil should be avoided, e.g. by using solid footwear. The effect of commonly used repellents has not been studied. Another strategy is to daily inspect the feet and extract sand fleas at an early stage of penetration.

Further Reading

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4. Heukelbach J. Revision on tungiasis: treatment options and prevention. Expert Rev Anti Infect Ther 2006;4(1):151–7.
5. Walker SL, Lebas E, De Sario V, et al. The prevalence and association with health-related quality of life of tungiasis and scabies in schoolchildren in southern Ethiopia. PLoS Negl Top Dis 2017; 11(8):e0005808.