Clinical Vistas

A non-healing nodule in a returned traveller

A previously healthy 26-year-old man presented for evaluation of a non-healing nodule on the medial aspect of his right heel. The lesion began while he was on holiday in Peru 4 weeks previously. He did not recall any bite or trauma. He had worn shoes most of the time, but he had spent some time on beaches and had not worn footwear while sleeping. The lesion began as a 1-mm pruritic and painless black spot with surrounding redness and resulted in discomfort when walking. The patient reported minor serosanguinous discharge and increasing erythema. There were no systemic symptoms.

On examination, the patient looked well and was afebrile. The nodule on his right heel was 1 cm in diameter, with hyperkeratosis surrounding a 3-mm black centre with surrounding erythema. The nodule was nontender and exuded a serous discharge. There were no other cutaneous or mucocutaneous findings or lymphadenopathy.

The lesion was deroofed (Fig. 1) and its contents of eggs and feces expressed and transported in formalin (Fig. 2). Examination of the nodule base revealed a 6-mm dark brown spherical foreign body that was firmly attached to the base and was macerated during removal. A clinical diagnosis of tungiasis was made. The lesion was washed daily with 10% povidone iodine, and a course of cephalexin was given for the cellulitis. Culture of the ulcer base subsequently grew *Staphylococcus aureus* and a group G streptococcus. The patient had received tetanus toxoid immunization in the past 5 years. Within a week the erythema had resolved and the lesion was healing well.

Tungiasis is an uncommon ectoparasitic infection caused by the sand flea *Tunga penetrans*. Originally endemic to South America, it is now also found in Central America, the Caribbean, Asia and Africa. The flea's habitat is moist, sandy areas. The prevalence of tungiasis among local inhabitants of some regions reaches 50%.[1] However, North American travellers are rarely affected.

The flea has limited jumping ability, and infestation typically occurs on the feet. The fertilized female burrows into the skin, its head toward the epidermal–dermal junction and its anal–genital opening near the surface, which produces a pruritic reddish spot. The flea feeds on blood and enlarges to the size of a pea, which results in a whitish nodule with a central black dot corresponding to the anal–genital opening. One to 3 weeks after penetration, the flea expels eggs from the central opening. About 5 weeks after penetration, the flea dies and is sloughed off, leaving an ulcer that heals slowly.[1,2]

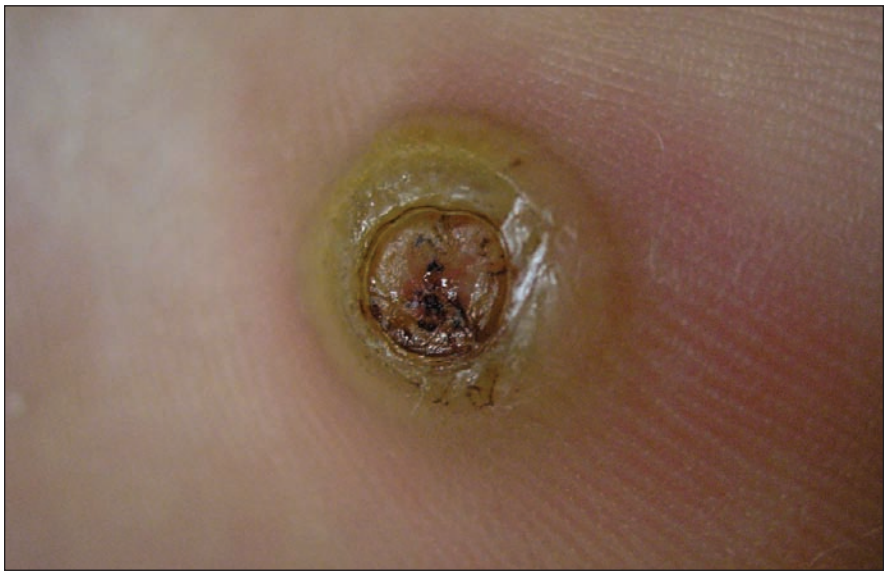

Fig 1: Deroofed nodule, 1 cm in diameter, on the heel of a man who had travelled to a tungiasis-endemic area.

Fig 2: Eggs and feces of the sand flea *Tunga penetrans* removed from the nodule.

Diagnosis is suggested by the history and confirmed by discovery of the parasite and eggs within the lesion.[1,2] The differential diagnosis in the traveller includes leishmaniasis, myiasis, dracunculiasis and cutaneous larva migrans as well as non-travel-related infections.[3]

Although the infestation is self-limited, tungiasis can result in disfigurement, superinfection, bacteremia, gas gangrene and tetanus.[2,3] Management consists of removal of the nodule contents and leaving the remaining ulcer to heal, or surgical excision of the whole lesion.[2,3] After extraction, the crater should be thoroughly cleaned and an antiseptic applied. Pending wound culture results, empiric antimicrobial therapy should be given if there are signs of superinfection. Tetanus prophylaxis is indicated.[3] Antiparasitic agents have had limited success and are not indicated in travellers with few lesions.[2] The use of insecticides on infested soils and domestic animals reduces the flea bur-

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den. Prevention consists of wearing closed footwear while visiting tungiasis-endemic areas. In addition, a biological repellent made from coconut and jojoba oil appears to be effective in reducing infestations.[3]

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