

## SHORT COMMUNICATION

### Two Cases of Imported Tungiasis with Severe *Staphylococcus aureus* Superinfection

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Tungiasis is an infestation caused by penetration in the skin of the gravid female of the flea *Tunga penetrans* (*T. penetrans*) Linnaeus 1758 (Insecta, Siphonaptera: Tungidae) (1). *T. penetrans* is endemic in Central and South America, Sub-Saharan Africa and Central Asia. It is uncommon in returning travellers (1): in a study on 269 patients presenting to a tropical disease unit in Paris, 6% were affected by tungiasis (2).

We describe two cases of imported tungiasis with severe *Staphylococcus aureus* superinfection.

#### CASE REPORTS

##### Case 1.

A 72-year-old man was admitted to our department because of a necrotic lesion on his 3<sup>rd</sup> right toe. The patient stated that the lesion had appeared 5 days earlier, during a trip to Recife (Brazil), where he visited public beaches walking barefoot. The patient complained of pain and fever ( $\leq 38.3^{\circ}\text{C}$ ).

Dermatological examination revealed the lack of the 2<sup>nd</sup> right toe because of a previous car crash, and the presence of a necrotic lesion beneath the nail plate of the 3<sup>rd</sup> right toe. The lesion was brown-black in colour (Fig. 1) and hard in consistency.

Surgical removal of the lesion revealed a bed with pus and necrotic material. Microscopical examination of this material revealed several eggs and fragments of the body of *T. penetrans*. A diagnosis of tungiasis was made. According to the Fortaleza classification, this tungiasis was classified as substage 3a (3).

General physical examination revealed right inguinal lymphadenopathy. Laboratory examinations showed leucocytosis (13,100 leucocytes/mm<sup>3</sup>) and increase in erythrocytation rate (ESR) (59 mm at the 1<sup>st</sup> h) and C-reactive protein (CRP) (39 mg/dl). Swab grew *S. aureus*, which was sensitive to several antibiotics.



Fig. 1. Necrotic lesion beneath the nail plate of the 3<sup>rd</sup> right toe of Case 1.

The patient was treated with topical gentamicin (2 applications/day for 2 weeks) and i.m. ceftriaxone (2 g/day for 10 days). An oral cox-2 inhibitor for 5 days was added to control pain. Complete healing was observed approximately 3 weeks later. Follow-up after 8 months was negative.

##### Case 2.

A 45-year-old man was admitted because of a swelling on his 4<sup>th</sup> left toe. The patient stated that the lesion had appeared one week earlier, during a trip to Fortaleza (Brazil), where he walked barefoot on public beaches. The patient complained of severe pain and fever ( $\leq 38^{\circ}\text{C}$ ).

Dermatological examination revealed a swelling involving the 4<sup>th</sup> left toe. It was violet-blue in colour, with a small ulcer from which blood and pus discharged. Furthermore, two sub-ungual papules, one brown in colour and 2 mm in diameter, and one yellowish and 5 mm in diameter, were observed (Fig. 2). A clinical diagnosis of substage 3a (3) tungiasis was made. From both papules, we removed several eggs and fragments of the body of *T. penetrans*.

General physical examination revealed left inguinal lymphadenopathy. Laboratory examinations showed leucocytosis (11,900 leucocytes/mm<sup>3</sup>) and increase in ESR (69 mm at the 1<sup>st</sup> h) and CRP (47 mg/dl). Bacteriological examination of pus was positive for *S. aureus*. X-rays and ultrasonography of the 4<sup>th</sup> left toe showed inflammation of soft tissues and early involvement of periosteum.

According to antibiogram results, the patient was treated with topical gentamicin (2 applications/day for 2 weeks) and oral amoxicillin (3 g/day for 2 weeks). An oral cox-2 inhibitor for 5 days was added to control pain. The patient slowly improved. Complete healing was observed approximately 4 weeks later. However, nail plate of the 4<sup>th</sup> left toe fell out. Follow-up after one year was negative.

#### DISCUSSION

Characteristic locations of tungiasis are toes, peri- and subungual folds, interdigital folds, soles and heels. Imported tungiasis is usually characterised by papular or nodular lesions, either single or multiple, grey or yellowish in colour, with a small brown-black central opening corresponding to the posterior portions of the abdomen of the flea (1). However, clinical manifestations may be polymorphous.

Bacterial superinfections are the most frequent complications of tungiasis (4–8). Prevalence of these superinfections varies by location: from 29.1–40% in Brazil (5, 7) to 33.3% in Haiti (6). In a group of 78 Brazilian patients, *S. aureus* was found in 35.5% of samples, followed by enterococci (29.5%) (4). Other bacteria isolated were *Bacillus* sp., *Enterococcus faecalis*, *Streptococcus pyogenes* and *Pseudomonas* sp. (4). Anaerobic superinfections, caused



Fig. 2. Severe swelling of the 4<sup>th</sup> left toe, with a small ulcer from which blood and pus discharge. Two subungual papules, one brown in colour and 2 mm in diameter, and one yellowish and 5 mm in diameter, are also visible.

by *Peptostreptococcus* sp. and *Clostridium* sp., were also observed (4). However, in our personal experience, based on approximately 50 cases of imported tungiasis observed since 1998, bacterial superinfections are very rare: we observed only one case of superinfection due to *S. aureus* and *Escherichia coli* (1). This observation may be due to better hygienic conditions in Western Europe in comparison with countries where tungiasis is endemic. Some cases of lymphangitis and lymphadenitis were also described (9).

Another complication of tungiasis is onychodystrophy, which is often followed by nail loss (6, 8). In a clinical study carried out in Fortaleza in 2004, 52.3% of patients had lost one or more nails (5). Lower percentages were recorded in other studies: 27.4% in Brazil in 2006 (10), 19% in Brazil in 2007 (7) and 16.3% in Nigeria in 2007 (8). Nail loss is due to the chronic peri- and subungual presence of the fleas; however, it can also represent the final clinical outcome of cellulitis, abscess, osteomyelitis and gangrene (10). The latter can also necessitate the amputation of toes (6).

In 1998, Chadee (11) reported 16 patients with sepsis caused by 7 different species of bacteria (*Streptococcus pyogenes*, *S. beta-haemolyticus*, *Klebsiella aerogenes*, *Enterobacter agglomerans*, *S. aureus*, *Escherichia coli* and *Bacillus* sp.).

Tetanus is a rare complication of tungiasis (6, 11–15). Eleven cases were described in Congo (14). Additional 6 patients were reported in Brazil (15).

Although this is an uncommon observation in Western countries, tungiasis must be considered in travellers coming from tropical and subtropical countries. Furthermore, Western dermatologists should be aware of the possibility of severe bacterial superinfections of imported tungiasis.

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