

Onychomycosis due to *Aspergillus tamarii* in a 3-year-old Boy

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Accepted October 4, 2004.

Sir,

Onychomycosis is most often caused by dermatophytes, particularly *Trichophyton rubrum* and *T. mentagrophytes*, which account for approximately 90% of nail infections (1, 2). *Candida* species, especially *C. albicans* and *C. parapsilosis*, are the major yeasts responsible for onychomycosis (1). Other fungi may occasionally be responsible for infection, including species of *Scopulariopsis*, *Fusarium*, *Scytalidium*, *Aspergillus* and *Onychocola canadensis* (1, 3). In this paper we report a case of *Aspergillus tamarii* onychomycosis in a child.

CASE REPORT

A boy aged 3.5 years, born in Denmark but of Somalian extraction, presented with a 3-month history of a dystrophic right great toe nail (Fig. 1). The right great toe nail showed onycholysis and the nail plate was fragile with dark discoloration in the lateral proximal part. The other nails were normal, and the skin of the soles and interdigital webs was normal. Nail samples were stained with blankophor and microscopically studied after 24 h. Direct microscopy showed globose conidial heads with metulae and phialides giving the diagnosis *Aspergillus* (Fig. 2). Initially there was no suspicion of non-dermatophyte onychomycosis. Therefore nail fragments were primarily inoculated only on Sabouraud agar with chloramphenicol and cycloheximide. The culture was negative. He was otherwise in perfectly good health, and had no history of trauma or nail abnormalities prior to the present lesion.



Fig. 1. Right great toe nail with onycholysis and dark discoloration in the lateral proximal part.

New samples were obtained after 3 and 6 weeks to confirm the diagnosis of *Aspergillus*. After 3 weeks a sample stained with blankophor showed hyphae with irregular swellings and vesicles consistent with *Aspergillus*. This microscopy finding is distinct from the hyphae and regular chains of arthroconidia produced in tissues by dermatophytes.

Fragments were inoculated on vegetable juice agar and Sabouraud agar without cycloheximide. The culture was positive for *Aspergillus* and identification was carried out according to standard methods. HPLC analysis of metabolites (carried out by Jens Frisvad at the Technical University of Denmark) confirmed the identification of *A. tamarii*. Before treatment was initiated a third sample was obtained. Again microscopy showed irregular swellings; however, the culture was negative. After removal of the nail plate with 40% urea cream the patient was treated with topical terbinafine for 4 months. This resulted in a complete clearing of the nail abnormalities.

The *Aspergillus* isolate was deposited at the Technical University of Denmark, Center for Microbial Biotechnology, with accession no. IBT 926081.

DISCUSSION

Together with other moulds, *A. tamarii* is frequently found in nature as a saprophyte in soil and as a plant pathogen, mostly in tropical areas. Furthermore it can be found in spices (4).

Several *Aspergillus* species have previously been described as being responsible for onychomycosis – *A. versicolor*, *A. terreus*, *A. fumigatus*, *A. flavus* and

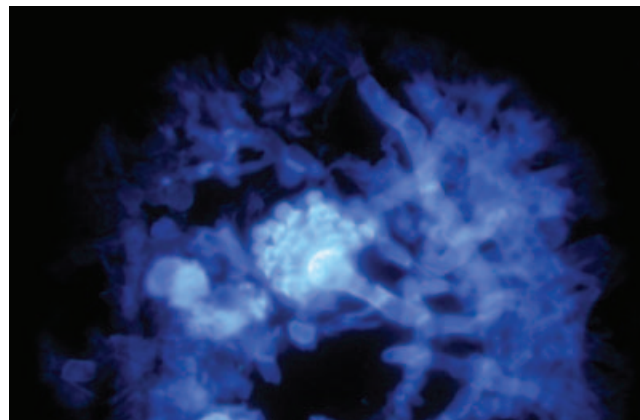


Fig. 2. Microscopy of blankophor-stained material showing globose conidial head with metulae and phialides.

A. niger (1–3, 5, 6). *A. tamarii* is an unusual cause of infection, but has been implicated in a case of nasosinus aspergillosis and in a case of eyelid infection (7, 8). To our knowledge the present case is the first onychomycosis due to *A. tamarii*.

The prevalence of non-dermatophyte moulds as nail invaders ranges from 1.45% to 17.6%, which may reflect variations in the geographic distribution of moulds and different diagnostic methods (3). Affection of toe nails occurs in almost all cases of onychomycosis by opportunistic moulds (2, 9), but clinical differences from dermatophyte infection most often are not obvious.

The confirmation of saprophytic moulds as the agents responsible for nail infection is difficult because of ubiquitous occurrence. When involved in infection, they are generally considered secondary invaders in nails with pre-existing disease or trauma (9); however, this is not always the case. Our patient had no known trauma or pre-existing disease, nor was he immunocompromised. We established the diagnosis on the basis of the following findings. i) Nail abnormalities consistent with onychomycosis combined with ii) several microscopic examinations with observations consistent with *Aspergillus*, iii) culture positive for *Aspergillus* and iv) absence of any growth of dermatophytes.

Treatment of non-dermatophyte onychomycosis is not well standardized, and can be difficult. However, *Aspergillus* onychomycosis is shown to respond well to therapy. Systemic antifungals such as itraconazole have been used successfully. Topical treatment with cyclosporin nail lacquer or topical terbinafine also seems to be

effective (3). Application of topical terbinafine was effective in our patient.

REFERENCES

1. Gupta AK, Ryder JE, Baran R, Summerbell RC. Non-dermatophyte onychomycosis. *Dermatol Clin* 2003; 21: 257–268.
2. Torres-Rodríguez JM, Madrenys-Brunet N, Siddat M, López-Jodra O, Jimenez T. *Aspergillus versicolor* as cause of onychomycosis: report of 12 cases and susceptibility testing to antifungal drugs. *J Eur Acad Dermatol Venereol* 1998; 11: 25–31.
3. Tosti A, Piraccini BM, Lorenzi S. Onychomycosis caused by nondermatophytic molds: clinical features and response to treatment of 59 cases. *J Am Acad Dermatol* 2000; 42: 217–224.
4. Samson RA, Hoekstra ES, Frisvad JC, Filtenborg O. Identification of the common food and airborne fungi. In: Introduction to food- and airborne fungi, 6th edn. Utrecht, The Netherlands: Centraalbureau voor Schimmelcultures, 2000; 88.
5. Torres-Rodríguez JM, Balaguer-Meler J, Martinez AT, Antonell-Reixach J. Onychomycosis due to a fungus of the *Aspergillus versicolor* group. *Mycoses* 1988; 31: 579–583.
6. Tosti A, Piraccini BM. Proximal subungual onychomycosis due to *Aspergillus niger*: report of two cases. *Br J Dermatol* 1998; 139: 156–157.
7. Paludetti G, Rosignoli M, Ferri E, Cesari MR, Morace G, Fantoni M, et al. Invasive nasosinus aspergillosis in an immunocompetent patient. *Acta Otorhinolaryngol Ital* 1992; 12: 581–591.
8. Degos MMR, Segretain G, Badillet G, Maisler A. Aspergillose de la paupière. *Bull Soc Fr Dermatol Syphiligr* 1970; 77: 732–734.
9. English MP. Nails and fungi. *Br J Dermatol* 1976; 94: 697–701.