

CAN ONYCHOSCOPY ALLEVIATE THE NEED FOR MYCOLOGICAL EXAMINATION IN ONYCHOMYCOSIS? ABOUT A CASE

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Abstract

Direct microscopy and fungal culture are the gold standard for the diagnosis of onychomycosis. However, onychoscopy has recently been recognized as an effective tool that help clinicians increase the diagnostic accuracy of onychomycosis; but does onychoscopy predict the causative agent in onychomycosis and consequently alleviate the need for mycological examination, and guide the treatment, especially for molds? Here we report a case of onychomycosis to a rare mould named *Onychocola Canadensis* in a young sportive woman where onychoscopy was not helpful for the diagnosis of the causative agent.

Keywords: Onychomycosis, Mould, *Onychocola canadensis*, Nail fungal infection, Toenail, Mycological examination.

INTRODUCTION

Onychomycosis is a common reason for consultation in dermatology and about 50% of nail diseases (Gupta *et al.*, 2020). The causal agents include three groups of fungi: dermatophytes (responsible for most infections), non-dermatophytic molds and yeasts (Gupta *et al.*, 2020). Direct microscopy and fungal culture are the gold standard for the diagnosis of onychomycosis. However, onychoscopy has recently been recognized as an effective tool that help clinicians increase the diagnostic accuracy of onychomycosis; but does onychoscopy predict the causative agent in onychomycosis and consequently alleviate the need for mycological examination, and guide the treatment, especially for molds? We answer to this question through a case report of onychomycosis to a rare mould named *Onychocola Canadensis* in a young sportive woman.

CASE REPORT

A 25-year-old woman, with no previous medical history, presented to the dermatological outpatient with dystrophy of the 1st and 2nd right toenails evolving for 1 year. The patient was a runner and rock climber and wore tight shoes. On examination, the patient presented with deviation of the axis of the 1st toe nails. The right 1st toe nail was yellow and tickened with onycholysis and subungual hyperkeratosis associated to onycholysis of the right 2nd toenail and multiple Beau's lines, especially in the right ones. We noted toe web intertrigo. The finger nails, interdigital spaces, palms and soles were spared. Dermoscopy of the 1st right toenail found yellow discoloration with an irregular macular pattern, a total hazy homogeneous background, subungual hyperkeratosis and lamellar micro-splitting. On the 2nd right toenail, there was a linear onycholysis and lamellar micro-splitting. Dermoscopy of the other toenails showed beau's lines and lamellar micro-splitting.



Fig. 1. Deviation of the axis of the 1st toe nails with onycholysis, subungual hyperkeratosis and yellow discoloration of the right 1st toe nail. Multiple Beau's lines of the right 2nd toenail



Fig. 2. Yellow discoloration with irregular macular pattern, total hazy homogeneous background and lamellar micro-splitting

Nail scrapings were taken and submitted to the local laboratory for mycological examination. Direct examination revealed mycelial filaments. The culture on Sabouraud's medium allowed the isolation of a pseudodermatophyte *Onychocola canadensis*. The patient was treated sequentially with oral terbinafine for six months (7 days per month for 6 months) associated with mechanical avulsion after softening with urea.

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The outcome was good. The patient reported herself to be cured.



Fig. 3. Linear onycholysis and lamellar micro-splitting

DISCUSSION

Onychocola canadensis is an Ascomycete fungus belonging to the order Onygenales and the family Arachnomycetaceae. It was isolated for the first time in 1990 in Canada by Singler (Sigler and Congly, 1990), since then it has been the subject of some well documented observations in cold climate regions (New Zealand, United Kingdom, France, Belgium, Italy, Spain, Turkey, Czech Republic, Slovakia) (Campbell *et al.*, 1997; Contet-Audonneau *et al.*, 2000; Koenig *et al.*, 1997) with a few cases reported in Maghreb countries (Tunisia and Morocco) (Hajoui *et al.*, 2012; Chabasse and Pihet, 2014). In molds onychomycosis studies, it represents only 0.7% of cases, the most common germ being *Aspergillus* (Chabasse and Pihet, 2014). The analysis of cases reported since 1990 highlights certain elements that allow a better definition of *Onychocola canadensis*. It seems to preferentially affect elderly people (mean age: \pm 70 years) with trophic disorders of the lower limbs. There is no case described so far in children. Women are more often affected than men. It is also noted that a large majority of the affected subjects live in rural areas and have occupations or hobbies related to working on the soils, which suggests a telluric origin (Gupta and Horgan-Bell, 1998). Young people usually have the lowest prevalence of onychomycosis among all age groups, but those participating in competitive sports have predictive factors including foot and toenail trauma, occlusive footwear, chronically moist feet and hyperhidrosis (Daggett *et al.*, 2019). All these factors can explain such a rare etiology in a young woman. Clinically, *Onychocola canadensis* causes onychia of the toenails, with more frequent involvement of the big toe, in the form of "distal and lateral subungual onychomycosis", often white or yellowish in color, with thickened, hyperkeratotic nails, containing a large quantity of subungual material. Common dermoscopic patterns of onychomycosis include jagged proximal edges of onycholysis with a longitudinal spike pattern, distal irregular termination of subungual hyperkeratosis, chromonychia and lamellar micro-splitting (Hazarika *et al.*, 2012). In contrast to onychomycosis, traumatic onycholysis consisted of linear edges without peaks in the area of onycholysis, which suggests the addition of the traumatic factor to the onychomycosis in our sportive patient (Piraccini *et al.*, 2013). Moreover, the dermoscopic signs found in our patient has already been described in the literature as related to dermatophytes and are therefore not specific to molds (Chetana *et al.*, 2018).

Therapeutically, *Onychocola canadensis* appears to be resistant to the usual treatments for onychomycosis. Studies have shown a susceptibility of the organism to griseofulvin (Sigler and Congly, 1990), ketoconazole griseofulvin (Sigler and Congly, 1990), terbinafine and amorolfine (Contet-Audonneau, 2000). A triple therapy can be proposed combining sequential administration of itraconazole, local application of amorolfine and chemical avulsion of the diseased nail.

Conclusion

Onychoscopy can be a complementary tool in clinical diagnosis of onychomycosis to molds. However, fungal cultures remain necessary in order to obtain an etiological diagnosis and antifungal sensitivity.

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