Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Parasitology–Mycology

Onychomycosis Due to Onychocola Canadensis: A Case Report and Literature Review

Berrada Z[1*], Mejdoub S[1], Bennai RM[1], Iken M[1], Lmimouni BE[1], Naoui H[1]

[1]Department of Parasitology–Mycology, Faculty of Medicine and Pharmacy of Rabat, Mohammed V Military Teaching Hospital of Rabat, Rabat, Morocco

DOI: https://doi.org/10.36347/sjmcr.2025.v13i11.011 | **Received:** 14.09.2025 | **Accepted:** 01.11.2025 | **Published:** 06.11.2025

***Corresponding author:** Berrada Z
Department of Parasitology–Mycology, Faculty of Medicine and Pharmacy of Rabat, Mohammed V Military Teaching Hospital of Rabat, Rabat, Morocco

Abstract **Case Report**

Onychomycosis caused by pseudodermatophytes, including Onychocola canadensis, remains an underdiagnosed condition with significant clinical implications. We report the case of a 60-year-old woman presenting with distal and lateral subungual onychomycosis confirmed to be caused by O. canadensis. Diagnosis was established through direct microscopy and culture. Oral terbinafine combined with topical amorolfine yielded satisfactory results. The rarity of O. canadensis in clinical practice combined with its slow growth, subtle clinical presentation, and inconsistent therapeutic response underscores the need for increased awareness among clinicians and microbiologists.

Keywords: Onychomycosis; Onychocola canadensis; Pseudodermatophytes; Antifungal therapy.

INTRODUCTION

Onychomycosis, a fungal infection of the nails, represents a significant portion of superficial mycoses, primarily caused by dermatophytes, yeasts, or pseudodermatophytes. Among these, Onychocola canadensis a pseudodermatophyte first described in Canada in 1990 has emerged as a rare but noteworthy etiologic agent of onychomycosis in temperate climates [1,2]. This study, combining a clinical case and an in-depth literature review, aims to enhance existing knowledge on O. canadensis and clarify its clinical, biological, and therapeutic features.

CASE PRESENTATION

A 66-year-old Moroccan woman residing in England presented with progressive discoloration and thickening of both great toenails evolving over six months. Her medical history was unremarkable, with no history of trauma, venous insufficiency, immunosuppressive medication use, or exposure to communal bathing areas.

Clinical examination revealed marked thickening, yellow–brown discoloration, and subungual hyperkeratosis of both great toenails. The nails were brittle and friable, with evident distal onycholysis (Figure 1). No associated lesions were observed.

A mycological sample was collected. Direct examination with 20% potassium hydroxide (KOH) revealed the presence of septate hyphae with irregular branching and arthrospores (Figure 2). Cultures were performed on Sabouraud agar with and without cycloheximide. After incubation at 28°C for 16–21 days, whitish to grayish colonies with lobulated margins and a powdery texture appeared (Figure 3). Microscopic examination with lactophenol cotton blue revealed typical features of O. canadensis, including fine, hyaline, septate filaments and chains of arthrospores arranged at right angles along the filaments. These arthrospores were oval to cylindrical, uni- or bicellular, detaching in small chains (Figure 4). These morphological features confirmed the diagnosis of distal–lateral subungual onychomycosis caused by O. canadensis.

The patient was treated with oral terbinafine 250 mg daily for 12 weeks, combined with weekly nail debridement. Topical amorolfine was applied twice weekly. At the three-month follow-up, partial regrowth of healthy nail tissue was observed.

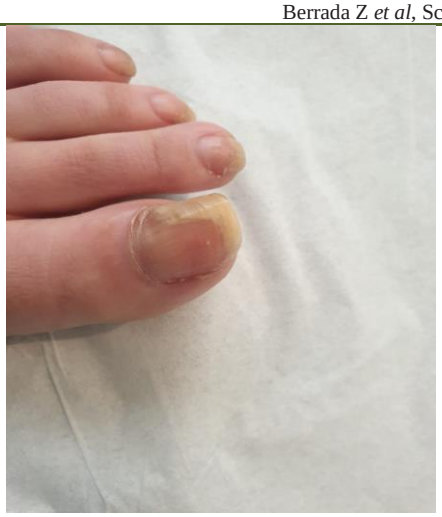

Figure 1: Distal-lateral onychomycosis of the great toenail

Figure 2: Microscopic examination showing septate hyphae and aleurioconidia in a 20% potassium hydroxide (KOH) preparation under light microscopy (×400)

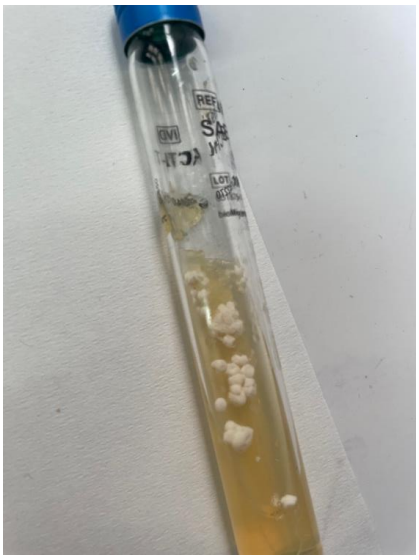

Figure 3: Fungal colony growth on Sabouraud agar showing morphology characteristic of Onychocola canadensis.

Figure 4: Microscopic examination of Onychocola canadensis showing septate hyphae and arthroconidia stained with lactophenol cotton blue (×400)

DISCUSSION

Historically, these organisms were considered contaminants or secondary invaders; however, accumulating data have highlighted their pathogenic role in certain clinical contexts [3,4]. Initially isolated in three cases of great toenail infection, O. canadensis has since been reported in Canada, Europe, and New Zealand, reflecting its likely cosmopolitan but underdiagnosed nature [2,5]. Taxonomically, O. canadensis belongs to the Onygenaceae family, with Arachnomyces nodosetosus representing its teleomorph [6].

Morphologically, this fungus is characterized by slow-growing colonies that often require several weeks of incubation to mature, with a velvety to powdery texture and distinct chains of arthroconidia under microscopy [2,7]. These growth features pose diagnostic challenges, as routine mycological protocols are optimized for faster-growing dermatophytes, which may lead to underreporting of this organism [10].

Epidemiologically, O. canadensis shows a predilection for older populations—particularly women—and individuals engaged in agricultural or horticultural activities, suggesting a possible environmental reservoir [7,11]. Soil has been proposed as a likely source of inoculum, although direct environmental isolation remains rare [10].

Clinically, O. canadensis is primarily associated with distal–lateral subungual onychomycosis (DLSO) and, less commonly, with superficial white onychomycosis (SWO) [5,11]. The disease manifests as nail thickening, discoloration, friability, and subungual hyperkeratosis, making it difficult to differentiate from other fungal nail infections [12].

The present case shares notable similarities and differences with previously reported cases [16]. The patient's demographic profile (an older woman) aligns with the documented predilection for elderly females [2,5]. Interestingly, no environmental or occupational exposure was identified, despite several reports suggesting an association with agricultural or rural contexts. Moreover, the absence of prior trauma or systemic immunosuppression is consistent with observations that O. canadensis may infect otherwise healthy individuals [8,9].

The diagnostic process for this pseudodermatophyte is challenging. Although direct microscopy and culture can confirm fungal elements, the slow growth and nonspecific colony morphology may necessitate complementary testing using mass spectrometry for definitive identification. Similar obstacles were reported by Järv in Estonia [8] and by Fanti *et al.*, in Italy [5], where standard laboratory methods initially failed to identify the pathogen [3,6]. Molecular methods such as ITS (Internal Transcribed Spacer) sequencing [13,15] and MALDI-TOF mass spectrometry in other studies [17] have proven valuable for accurate identification, underscoring the need to integrate these techniques into routine mycological analysis—particularly given the ongoing debate around the pathogenic role of O. canadensis, which requires rigorous diagnostic criteria [12,13].

Regarding therapeutic outcomes, the response to combined oral terbinafine/topical amorolfine in this case is consistent with therapeutic regimens reported in Belgium [9] and Spain [11], where combination therapy yielded partial or complete resolution. Minimum inhibitory concentration (MIC) values from susceptibility testing corroborate terbinafine's efficacy, supporting its role as a first-line systemic agent for O. canadensis infections. Nonetheless, the variability in

therapeutic response observed across the literature highlights the need for individualized treatment plans based on antifungal susceptibility profiles and patient-specific features [14,15].

To provide a broader clinical perspective, Table 1 summarizes the principal features of previously published cases, highlighting the spectrum of clinical manifestations, diagnostic procedures, and antifungal treatments reported.

Table 1. Summary of reported cases of Onychocola canadensis

Authors	Year	Country	Number of cases	Clinical presentation	Diagnostic methods	Treatment
Sigler & Congly	1990	Canada	3	DLSO*	Microscopy, culture	Not specified
Gupta & al.	1998	USA	10	DLSO*, SWO**	Microscopy, culture, molecular	Terbinafine, itraconazole
Fanti & al.	2003	Italy	1	DLSO*	Microscopy, culture	Terbinafine
Van Esbroeck & al.	2003	Belgium	4	DLSO*	Microscopy, culture	Combination therapy
Järv	2015	Estonia	1	DLSO*	Microscopy, culture, molecular	Terbinafine, amorolfine
Nenoff & al.	2016	Germany	1	DLSO*	Microscopy, culture	Not specified
Llovo & al.	2002	Spain	2	DLSO*	Microscopy, culture	Combination therapy
Contet-Audonneau & al.	1997	France	1	DLSO*	Microscopy, culture	Not specified

* DLSO: distal–lateral subungual onychomycosis;
** SWO: superficial white onychomycosis.

CONCLUSION

This case report underscores the complexity of diagnosing and treating onychomycosis caused by Onychocola canadensis. The diagnostic approach relies on traditional mycological techniques and may sometimes require MALDI-TOF mass spectrometry for precise identification of the pathogen. Management with oral terbinafine and topical amorolfine yielded partial improvement followed by recovery, highlighting the importance of a personalized approach to optimize clinical outcomes.

Ethical Approval and Consent to Participate

The study was exempt from ethical approval in our institution. Written informed consent was obtained from the patient for the publication of this case report and the associated images.

Data Availability

The datasets used and analyzed during the study are available from the corresponding author upon reasonable request.

Conflict of Interest: The authors declare no conflicts of interest.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Authors' Contributions: All authors read and approved the final manuscript.

REFERENCES

1. Sigler L, Congly H. Toenail infection caused by Onychocola canadensis gen. et sp. nov. J Med Vet Mycol. 1990; 28:405–417.
2. Gupta AK, Horgan-Bell CB, Summerbell RC. Onychomycosis associated with Onychocola canadensis: Ten case reports and a review of the literature. J Am Acad Dermatol. 1998; 39:410–417.
3. English MP. Nails and fungi. Br J Dermatol. 1976; 94:697–701.
4. Gupta AK, Cooper EA, MacDonald P, Summerbell RC. Utility of inoculum counting in clinical diagnosis of onychomycosis caused by non-dermatophytic filamentous fungi. J Clin Microbiol. 2001; 39:2115–2121.
5. Fanti F, Conti S, Zucchi A, Polonelli L. First Italian report of onychomycosis caused by Onychocola canadensis. Med Mycol. 2003; 41:447–450.
6. Sigler L, Abbott SP, Woodgyer AJ. New records of nail and skin infection due to Onychocola canadensis and description of its teleomorph Arachnomyces nodosetosus sp. nov. J Med Mycol. 1994; 32:275–285.
7. Baeck M, Laukes N, Decroix J, Surmont I. Onychomycosis caused by Onychocola canadensis. Ann Dermatol Venereol. 2006; 133:380–385.
8. Järv H. Onychomycosis caused by Onychocola canadensis: The first report in Estonia and lessons to learn. Mycoses. 2015; 58:113–117.
9. Van Esbroeck M, Wuytack C, Van Looveren K, Swinne D. Isolation of Onychocola canadensis from four cases of onychomycosis in Belgium. Acta Clin Belg. 2003; 58:190–192.

10. Nenoff P, Schorlemmer B, Uhrlaß S, *et al.*,Onychocola canadensis Sigler in onychomycosis: a new dermatophyte-like mold in Germany. Hautarzt. 2016; 67:110–115.
11. Llovo J, Prieto E, Vazquez H, *et al.*,Onychomycosis due to Onychocola canadensis: Report of the first two Spanish cases. Med Mycol. 2002; 40:209–212.
12. de Hoog GS, Guarro J, Gené J, Figueras MJ. Atlas of Clinical Fungi. 2nd ed. Utrecht/Reus: Centraalbureau voor Schimmelcultures/Universitat Rovira i Virgili; 2000.
13. Summerbell RC, Kane J, Krajden S. Onychomycosis, tinea pedis and tinea manuum caused by non-dermatophytic filamentous fungi. Mycoses. 1989; 32:609–619.
14. Erbagci Z, Balci I. Cutaneous hyalohyphomycosis and onychomycosis caused by Onychocola canadensis: First case from Turkey. J Dermatol. 2002; 29:522–528.
15. Campbell CK, Johnson EM, Warnock DW. Nail infection caused by Onychocola canadensis: first four British cases. J Med Vet Mycol. 1997; 35:423–425.
16. Contet-Audonneau N, Schmutz JL, Basile AM, de Bievre C. A new agent of onychomycosis in the elderly: Onychocola canadensis. Eur J Dermatol. 1997; 7:115–117.
17. L'Ollivier C, Cassagne C, Normand A-C, Bouchara J-P, Contet-Audonneau N, Hendrickx M, Fourquet P, Coulibaly O, Piarroux R, Ranque S. A MALDI-TOF MS procedure for clinical dermatophyte species identification in the routine laboratory. Medical Mycology. 2013;51(7):713–720.