ONYCHOMYCOSIS CAUSED BY ALTERNARIA ALTERNATA: A RARE CASE REPORT
ALTERNARIA ALTERNATA ONYCHOMYCOSIS

ALTERNARİA ALTERNATA'YA BAĞLI ONİKOMİKOZ: NADİR BİR OLGU SUNUMU
ALTERNARİA ALTERNATA ONİKOMİKOZU

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ABSTRACT

Onychomycosis is a fungal infection of the nail unit caused by dermatophytes, non-dermatophyte molds, or yeasts. Among non-dermatophyte molds, Alternaria alternata is a dematiaceous fungus that only rarely involves the nail apparatus. Herein, we report a case of A. alternata–associated onychomycosis affecting a single toenail. Diagnosis was established by direct microscopy and culture, supported by characteristic morphological features. The patient was initiated on oral and topical terbinafine and remains under follow-up, with treatment response currently being monitored. This case highlights the diagnostic challenges and therapeutic considerations associated with rare non-dermatophyte mold infections of the nail.

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ÖZET

Onikomikoz, dermatofitler, nondermatofit küfler veya mayalar tarafından oluşturulabilen tırnak ünitesinin fungal enfeksiyonudur. Nondermatofit küfler arasında Alternaria alternata, tırnak aparatını nadiren tutan dematiyöz bir mantar olmakla birlikte hem immünsüprese hem de altta yatan belirgin immün yetmezliği olmayan bireylerde onikomikoza yol açabilmektedir. Bu yazıda, tek bir ayak tırnağında A. alternata'ya bağlı onikomikoz saptanan bir olgu sunulmuştur. Tanı, direkt mikroskopik inceleme ve kültür ile desteklenen karakteristik morfolojik bulgulara dayanılarak konulmuştur. Hasta oral ve topikal terbinafin tedavisine alınmış olup klinik izlemi devam etmektedir.

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Introduction

Onychomycosis is a prevalent fungal infection of the nail, most commonly attributed to dermatophytes, with non-dermatophyte molds (NDMs) and yeasts being less frequent etiologic agents (1). NDM onychomycosis remains diagnostically challenging, as these organisms may represent environmental contaminants and require clinicomycological correlation and culture-based confirmation (2, 3). Among NDMs, *Alternaria alternata*, a dematiaceous fungus, is an uncommon cause of nail infection but has been reported in both immunocompromised and otherwise healthy individuals.

Here, we present a case of toenail onychomycosis caused by *A. alternata*, emphasizing diagnostic features and therapeutic considerations.

Case

A 64-year-old male patient presented with a six-month history of discoloration of the left great toenail. His medical history was notable for familial Mediterranean fever (FMF) and type 2 diabetes mellitus. At presentation, fasting plasma glucose was 124 mg/dL. Recent HbA1c data were not available; however, there was no clinical evidence suggestive of severe or uncontrolled disease. There was no history of trauma or prior nail disease, and family history was unremarkable.

On clinical examination, the left great toenail demonstrated yellowish discoloration, diffuse nail plate thickening, and subungual hyperkeratosis. The nail plate appeared brittle, accompanied by friable subungual debris. In addition, features suggestive of pterygium formation were observed (Figure 1). The remaining fingernails and toenails were normal, and no periungual or interdigital skin involvement was detected. The patient reported no hobbies or occupational activities involving soil contact, such as gardening or farming.

Figure 1. Clinical appearance of the left great toenail showing yellowish discoloration, diffuse nail plate thickening, subungual hyperkeratosis, a brittle nail plate with friable subungual debris, and features suggestive of pterygium formation.

Direct microscopic examination of nail scrapings with 10% potassium hydroxide (KOH) revealed brownish, septate, branching hyphae consistent with a dematiaceous fungus. No budding yeast cells were observed. Subsequently, the specimen was inoculated onto Sabouraud dextrose agar (SDA) and incubated at 25 °C. After approximately seven days, dark, velvety colonies with a grayish-black surface and a black reverse developed (Figure 2A). Lactophenol cotton blue staining of the culture demonstrated chains of brown, multicellular (muriform) conidia with both transverse and longitudinal septa, characteristic of A. alternata, thereby confirming the etiological diagnosis (Figure 2B).

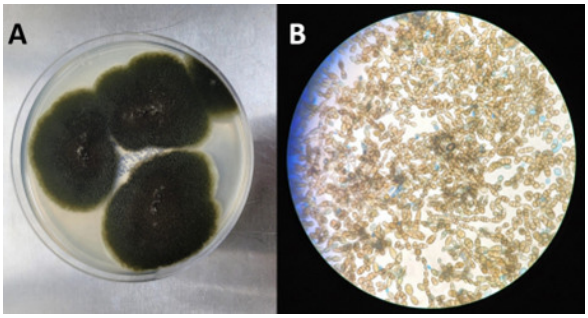

Figure 2. Mycological findings confirming *Alternaria alternata*. **(A)** Colony morphology on Sabouraud dextrose agar after seven days of incubation at 25 °C, showing dark, velvety colonies with a grayish-black surface and black reverse.
(B) Lactophenol cotton blue preparation demonstrating brown, multicellular (muriform) conidia in chains with transverse and longitudinal septa, characteristic of *A. alternata*.

Given the patient's ongoing colchicine therapy for FMF, systemic azole antifungals—particularly itraconazole—were avoided due to the risk of clinically significant pharmacokinetic interactions mediated by CYP3A4 and P-glycoprotein inhibition, which may increase colchicine toxicity. Although other systemic azoles such as voriconazole and posaconazole may have activity against dematiaceous fungi, their use was considered impractical in this case due to lack of reimbursement for dermatologic indications in Türkiye. Although topical azole agents would not be expected to result in systemic drug interactions, their clinical efficacy in onychomycosis is often limited by poor nail plate penetration. Therefore, treatment was initiated with oral terbinafine 250 mg daily in combination with topical terbinafine applied once daily to the affected nail and surrounding skin. The patient was additionally advised on nail hygiene, regular debridement, and avoidance of moisture and trauma. At the time of manuscript preparation, the patient remains under follow-up, and treatment response is being monitored.

Discussion

Onychomycosis represents one of the most prevalent disorders affecting the nail unit, accounting for nearly half of all nail pathologies (4). While dermatophytes remain the principal etiologic agents, non-dermatophyte molds (NDMs) contribute to a smaller yet clinically significant proportion, ranging from approximately 1.5% to 17.6% of reported cases (5). Among these, *Aspergillus*, *Scopulariopsis*, *Fusarium*, and *Acremonium* species are recognized as the most frequently implicated opportunistic pathogens (5).

Alternaria alternata is an uncommon etiologic agent of onychomycosis, with only sporadic cases reported in the literature. Although cutaneous phaeohyphomycosis caused by *Alternaria* species has been increasingly described, particularly in immunocompromised individuals, nail involvement by this dematiaceous mould remains exceedingly rare (6). In a retrospective study conducted in Tuscany between 1985 and 1999, nine cases of *Alternaria*-related onychomycosis were identified, eight caused by *A. alternata* and one by *A. chlamydospora* (6). Clinically, most patients presented with nail dystrophy and distal subungual hyperkeratosis, typically limited to one or two nails (6).

In general, onychomycosis caused by *Alternaria* species presents as a distal subungual infection, often affecting the great toenail, where fungal elements may become entrapped following minor trauma. The infection usually remains confined to the nail unit without extension to the surrounding skin. Clinically, these infections may exhibit brown to black discoloration due to the melanin pigment characteristic of dematiaceous fungi, in addition to nail thickening, subungual hyperkeratosis, and onychodystrophy (6).

A major diagnostic challenge in NDM onychomycosis is distinguishing true infection from environmental contamination. Therefore, clinicomycological correlation, supported by direct microscopy and consistent culture findings, is essential for accurate diagnosis (2, 3). In the present case, the diagnosis was supported by

compatible clinical findings, demonstration of pigmented septate hyphae on KOH examination, and characteristic culture morphology.

Therapeutic experience with *Alternaria* onychomycosis remains limited, as most available data derive from individual case reports and small case series. The infection is often difficult to eradicate and exhibits variable antifungal susceptibility, complicating treatment decisions. Among systemic antifungals, itraconazole and posaconazole have demonstrated the most consistent in vitro and clinical efficacy against *Alternaria* species due to their broad activity against dematiaceous fungi (6). Voriconazole has also shown favorable outcomes in selected cases (2). In contrast, terbinafine exhibits limited and variable efficacy, with most reports indicating reduced susceptibility and only occasional clinical success (7).

In the present case, systemic azole therapy was avoided due to the potential for clinically significant interaction with colchicine. Although topical azole agents would not be expected to result in systemic drug interactions, their efficacy in onychomycosis is often limited by inadequate nail plate penetration. Therefore, terbinafine was selected as a pragmatic alternative, taking into account drug availability, safety considerations, and clinical feasibility.

Given these challenges, management should be individualized, considering the extent of nail involvement, host factors, comorbidities, and potential drug interactions. Close follow-up is essential to monitor treatment response and minimize the risk of recurrence.

Conclusion

This case highlights the importance of recognizing non-dermatophyte molds, particularly Alternaria alternata, as potential etiologic agents of onychomycosis. Accurate identification through direct microscopy and culture remains essential for establishing the diagnosis and guiding appropriate management. Clinicians should maintain a high level of suspicion for dematiaceous fungi in cases that are atypical or unresponsive to conventional antifungal therapy. Early recognition and species-level diagnosis are critical to optimize treatment outcomes and reduce the risk of recurrence. This report further emphasizes the need for individualized therapeutic strategies, particularly in patients with comorbidities or concomitant medications that may limit the use of standard systemic azole antifungals.

Limitations

This report represents a single case and therefore has limited generalizability. Antifungal susceptibility testing and molecular confirmation were not performed. Representative photographic documentation of the direct KOH examination was not available. In addition, longer follow-up would provide a more robust assessment of treatment response and long-term outcomes.

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