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CASE REPORT

A rare cause of soft tissue infections: *Pseudallescheria boydii*

Meltem Işıkgöz Taşbakan[1], Uğur Önal[1], Dilek Yeşim Metin[2], Hüsnü Pullukçu[1], Tansu Yamazhan[1], Aygül Çeltik[3], Süleyha Hilmioğlu-Polat[1], Mehmet Argın[4], Sercan Ulusoy[1]

[1] *Ege University Faculty of Medicine Department of Infectious Diseases and Clinical Microbiology, İzmir, Turkey*
[2] *Ege University Faculty of Medicine Department of Microbiology, İzmir, Turkey*
[3] *Ege University Faculty of Medicine Department of Nephrology, İzmir, Turkey*
[4] *Ege University Faculty of Medicine Department of Radiology, İzmir, Turkey*

ABSTRACT

Pseudallescheria boydii, a rare cause of infection in humans, are saprofitic microorganisms which are found in soil. In this report, we describe a renal transplant patient who had a skin-soft tissue infection at the anterior side of her left tibia due to *P. boydii*. Tissue biopsy was taken from her tibial lesion. Pathologic examination revealed hyphae plus fungal spores and mycological cultures were positive for *P. boydii*. The fungus was also identified by molecular methods. Fluconazole and topical isoconazole nitrate were given to the patient until the antifungal susceptibility results were seen. Fluconazole was changed to itraconazole via susceptibility results. Clinical response was seen at the 1 month control.

Because of limited data regarding the optimal antifungal drug choice and duration of treatment for *P. boydii* infections, the proper identification of pathogen and antifungal susceptibility tests have vital importance. *J Microbiol Infect Dis 2015;5(4): 176-179*

Key words: *Pseudallescheria boydii*, renal transplant, soft tissue infection

Yumuşak doku enfeksiyonlarında nadir görülen bir etken: Pseudallescheria boydii

ÖZET

İnsanlarda nadiren enfeksiyona sebep olan *Pseudallescheria boydii*, toprakta bulunan saprofitik mikroorganizmalardır. Bu yazıda *P. boydii* nedenli sol tibia ön yüzde deri yumuşak doku enfeksiyonu olan böbrek nakilli bir hasta sunulmaktadır. Doku biyopsisi alınan hastada patolojik incelemede hifler ve fungal sporlar ile birlikte mikolojik kültürde *P. boydii* üremesi saptandı. Aynı zamanda üreyen mantar moleküler yöntemler kullanılarak da tanımlandı. Flukonazol ile topical izokonazol nitrat tedavileri antifungal duyarlılık sonuçları elde edilene dek uygulandı. Duyarlılık sonuçları ile birlikte flukonazol, itrakonazol olarak değiştirildi. Bir ay sonra kontrolde klinik olarak yanıt alındığı görüldü.

P. boydii için uygun antifungal tedavi seçimi ve tedavi süresi hakkında yeterli veri bulunmamasından dolayı patojenin tanımlanması ve antifungal duyarlılık sonuçlarının alınması çok önemlidir.

Anahtar kelimeler: *Pseudallescheria boydii*, böbrek nakli, yumuşak doku enfeksiyonu

INTRODUCTION

Pseudallescheria boydii is a saphophitic filamentous fungus which is classified under Ascomycota phylum. The asexual form of this organism is named as Scedosporium apiospermum and histologically resemble Aspergillus species, with hyphae that are septated and branching at acute angles. *P. boydii*, a rare cause of infection in humans, are saprofitic microorganisms which are found in soil.[1] It can be isolated from soil, polluted water, sewage and cause various infections in humans. These include cutaneous infections (esp. mycetoma), keratitis, pneumonia, lung abscess, endophthalmitis, corneal infection and osteomyelitis. Disseminated infections are often fatal if not treated.[2] In this report we present a renal transplant recipient with cutaneous infection caused by *P. boydii*.

CASE

A 62 years old female patient who was treated for one year because of gastrointestinal tuberculosis and had a kidney transplantation two years

Correspondence: Meltem Taşbakan, Ege University Faculty of Medicine, Department of Infectious Diseases and Clinical Microbiology, İzmir, Turkey E-mail: tasbakan@yahoo.com
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ago, admitted to our clinic with complaints of edema and erythema at the second finger of left foot plus painful (Figure 1), indurated edematous, app. 1x1.5 cm sized, lesion at the anterior side of left tibia. This lesion was present for four months as learned from her history. At her physical examination her body temperature: 36.6°C, blood pressure: 118/82 mmHg, Pulse rate: 88/min, respiratory rate: 18/min and her laboratory results were leukocyte: 7900/mm^3, neutrophile: 74%, CRP: 0.13 mg/dl, Sedimentation rate: 5 mm. Tissue biopsy was taken from her tibial lesion. During follow-up, patient didn't have any fever because of this, blood culture wasn't taken. Pathologic examination revealed hyphae and fungal spores. Nodular regeneration was seen with Gram staining and fungal hyphae were seen at gomori-methenamine staining and Periodic Acid-Shiff (PAS). Both bacteriologic and mycobacteriologic culture results were negative. Mycological cultures were performed, and on the third day, white mold colonies were detected in all plates (Figures 2 a and 2 b). Hyaline, smooth-walled, branched hyphae, and simple long or short conidiophores bearing mostly unicellular conidia, were observed by lactophenol cotton blue preparation. (Figure 2 c). With these features the fungus was considered as *P. boydii*. Because of well growth on sicloheximide containing medium, the fungus was resembled that of Chrysosporium spp., and molecular idendificaton was performed. DNA extraction and PCR amplification were performed as described previously.[3] The rDNA sequences spanning the internal transcribed spacer (ITS) 1 region were amplified on an ABI PRISM 3130XL genetic analyzer at Refgen Biotechnology (Ankara, Turkey) using the universal fungal primers ITS1 and ITS4. The CAP contig assembly software, included in the BioEdit Sequence Alignment Editor 7.0.9.0, was used to edit the sequences.[4] Assembled DNA sequences were examined using the BLAST (nucleotide-nucleotide) program from the National Center of Biotechnology Information (National Institute of Health, Bethesda, MD, USA). DNA sequence of the strain was 99% identical to the 537 nucleotides spanning the 18S rRNA gene (partial), ITS1, and 5.8S rRNA gene (partial) from *P. boydii* CBS 101723 (GenBank accession no: AY878947.1).

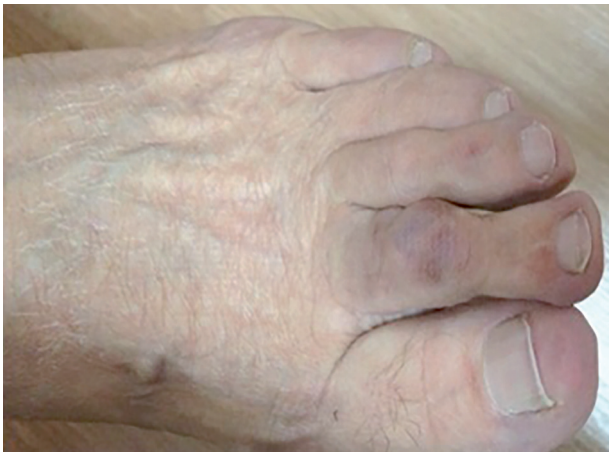
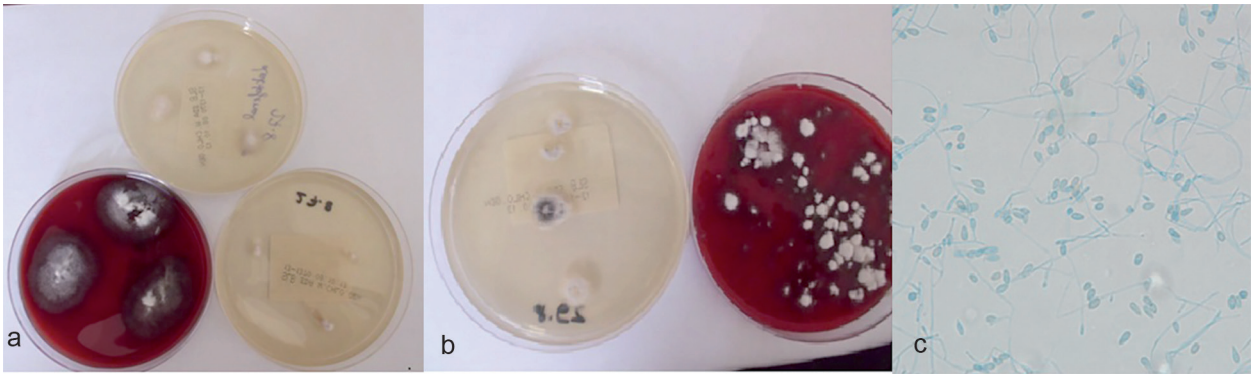


Figure 1. The edema and erythema at the second finger of left foot



Figures 2 a and 2 b. Mycological cultures were performed, and on the third day, white mold colonies were detected in all plates.

Figure 2 c. Hyaline, smooth-walled, branched hyphae, and simple long or short conidiophores bearing mostly unicellular conidia, were observed by lactophenol cotton blue preparation

Liposomal amphotericin B treatment was started but changed to the fluconazole (800 mg/day) due to allergic reactions. MIC results were reported as (AmB: >32 µg/ml, fluconazole: 24 µg/ml, itraconazole: 0.5 µg/ml, vorikonazole: 0.25 µg/ml, caspofungin: >32 µg/ml, anidulafungin: >32 µg/ml). After

these results the treatment was changed to itraconazole (200 mg/day/po).

MRI result of left foot and ankle was reported as app. 3x1.5x1.5 cm abscess which had septates and lobulated contures at the proximal phalanx soft tissue of 2nd finger without osteomyelitis (Figure 3). In order to confirmation; another punch biopsy from tibial lesion and aspiration of abscess at the 2nd finger of left foot were performed. *P. boydii* was identified from both of the mycological cultures again.

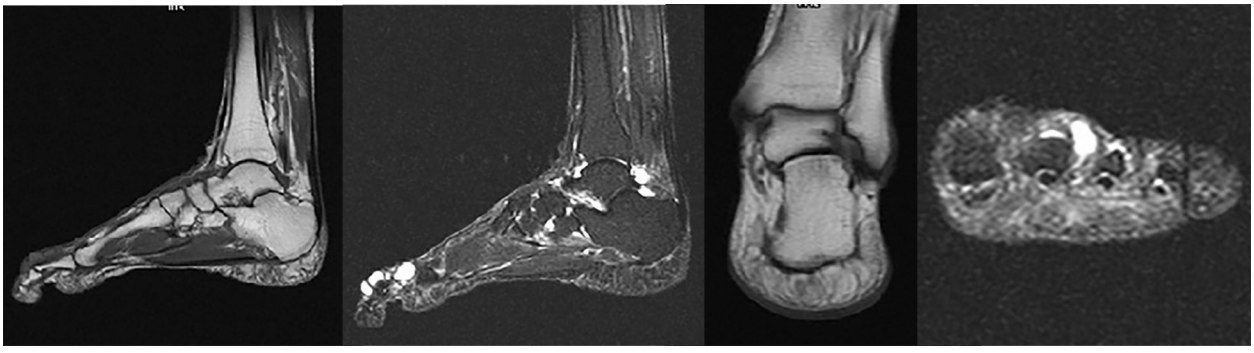


Figure 3. Foot and Ankle MRI sections

At the one month follow-up; clinical improvement at the lesion was seen. After one month, the patient was examined again and there was no pathology at her previous lesion site. So her treatment was stopped.

DISCUSSION

Since its discovery as an agent of mycetoma nearly a century ago, *P. boydii* with its asexual (synanamorphic) form, Scedosporium apiospermum, is now recognized as an important emerging opportunistic pathogen causing invasive mycosis in immunocompromised patients. *Pseudallescheria boydii* can cause various infections especially in immunocompromised patients such as cutaneous infection or brain infection in renal transplant patients.[5]

The most common site of bone and joint infection with *P. boydii* is by far the knee, followed by the hands and feet; hip and spine involvement has been the least often reported.[6] In our patient, lesions were at feet and leg. Dissemination may occur hematogenously or contiguously, with high associated mortality. Jayamohan et al. described twenty-four patients from whom *P. boydii* had been isolated. Four patients had disseminated disease and invasive disease was associated with underlying malignancy or transplantation.[1]

Starting the treatment as early as possible has a vital importance for immunocompromised patients. In order to give appropriate treatment, pathogen must be diagnosed correctly.

Scedosporium species are known to be largely resistant to traditional antifungals such as amphotericin B; however, treatment with newer triazoles, such as voriconazole, appears to be more efficacious. The optimal choice and duration of antifungal treatment is not standartized. Chaverio et al. treated a cutaneous infection caused by Scedosporium apiospermum with itrakonazole for 3 months as like as our report.[7] Although the most data on the treatment of Scedosporium infections are related to the use of voriconazole, the treatment should be planned via MIC levels as in our case report. Zeng et al, showed the results of the susceptibility examinations that most of the 10 *P. boydii* isolates and 17 *S. apiospermum* isolates were resistant to amphotericin B and flucytosine. Fluconazole, miconazole, itraconazole and voriconazole have antifungal activity,against *P. boydii*. Among these voriconazole showed the lowest MIC (MIC_{50} 0.06 µg/ml and MIC_{90} 0.125 µg/ml for *P. boydii*).[8]

Troke et al., analyzed efficacy of voriconazole in 107 patients with scedosporiosis.[2] The best therapeutic responses were seen for skin/subcutaneous (91%) or bone (79%) infections, and the lowest for CNS infections (43%). Patients without major immune suppression (72%) or those with solid organ transplantation (63%) or various hematological conditions (60%) showed the best responses by underlying condition. *S. apiospermum* MIC_{50}/MIC_{90} values for voriconazole 0.25/1.0, itraconazole 0.5/2.0, and amphotericin B 4.0/ >8.0 (2). Our patient was treated successfully by itraconazole.

There must be a multidisciplinary approach to these kind of infections. As in our patient, antibacterial treatment was given at the first step. After the molecular tests diagnosed the stain as *P. boydii* in contrast to conventional methods; our treatment was switched to itraconazole. Similar to this, Campagnaro et al described a patient whose biopsy results were initially reported as Aspergillus species, but later identified as *P. boydii*. Especially in immunocompromised patients, early diagnosis and treatment of opportunistic fungal infections have to be done in order to prevent dissemination.[9] Especially for critically ill patients, ampirical treatment should be started and possible biopsies and other tests have to be done for early diagnosis.

REFERENCES

1. Jayamohan Y, Ribes JA. Pseudallescheriasis: a summary of patients from 1980-2003 in a tertiary care center. Arch Pathol Lab Med. 2006;130:1843-1846.
2. Troke P, Aguirrebengoa K, Arteaga C, et al. Treatment of scedosporiosis with voriconazole: clinical experience with 107 patients. Antimicrob Agents Chemother 2008;52:1743.
3. Turin L, Riva F, Galbiati G, Cainelli T. Fast, simple and highly sensitive double-rounded polymerase chain reaction assay to detect medically relevant fungi in dermatological specimens. Eur J Clin Invest. 2000;30:511-518.
4. Hall TA. BioEdit: a user-friendly biological sequence alignment editor and analysis program for Windows 95/98 NT. Nucl Acids Symp Ser. 1999;41:95-98.
5. Cardoso JC, Serra D, Cardoso R, et al. Cutaneous *Pseudallescheria boydii* infection in a renal transplant patient: A case report. Dermatol Online J 2009;15:8.
6. Gottesman-Yekutieli T, Shwartz O, Edelman A, et al. *Pseudallescheria boydii* infection of a prosthetic hip joint-an uncommon infection in a rare location. Am J Med Sci 2011;342:250-253.
7. Chaveiro MA, Vieira R, Cardoso J, Afonso A. Cutaneous infection due to Scedosporium apiospermium in an immunosuppressed patient. J Euro Acad Dermatol Venereol 2003;17:47-49.
8. Zeng J, Kamei K, Zheng Y, Nishimura K. Susceptibility of *P. boydii* and Scedosporium apiospermum to new antifungal agents. Jpn J Med Mycol 2004;45:101-104.
9. Campagnaro EL, Woodside KJ, Early MG, et al. Disseminated *Pseudallescheria boydii* (Scedosporium apiospermum) infection in a renal transplant patient. Transpl Infect Dis 2002;4:207-211.