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

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**ABSTRACT**

*Pseudallescheria boydii*, a rare cause of infection in humans, are saprothetic 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

**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 saprothetic 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...
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 sicoheximide containing medium, the fungus was resembled that of Chrysosporium spp., and molecular identifcation 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 sequenc-es.$^4$ 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).

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 2\textsuperscript{nd} finger without osteomyelitis (Figure 3). In order to confirmation; another punch biopsy from tibial lesion and aspiration of abscess at the 2\textsuperscript{nd} finger of left foot were performed. \textit{P. boydii} was identified from both of the mycological cultures again.

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, \textit{P. boydii} with its asexual (synana-
morphic) form, \textit{Scedosporium apiospermum}, is now recognized as an important emerging opportunistic pathogen causing invasive mycosis in immunocom-
promised patients. \textit{Pseudallescheria boydii} can cause various infections especially in immunocom-
promised patients such as cutaneous infection or brain infection in renal transplant patients.\textsuperscript{5}

The most common site of bone and joint infection with \textit{P. boydii} is by far the knee, followed by the hands and feet; hip and spine involvement has been the least often reported.\textsuperscript{6} In our patient, lesions were at feet and leg. Dissemination may occur hematog-

eyously or contiguously, with high associated mortal-
ty. Jayamohan et al. described twenty-four pa-
tients from whom \textit{P. boydii} had been isolated. Four patients had disseminated disease and invasive disease was associated with underlying malignancy or transplantation.\textsuperscript{1}

Starting the treatment as early as possible has a vital importance for immunocompromised pa-
tients. In order to give appropriate treatment, patho-
gen must be diagnosed correctly.

Scedosporium species are known to be largely resistant to traditional antifungals such as ampho-
tericin B; however, treatment with newer triazoles,
such as voriconazole, appears to be more effica-
cious. The optimal choice and duration of antifungal treatment is not standartized. Chaverio et al. treated a cutaneous infection caused by \textit{Scedosporium apiospermum} with itraconazole for 3 months as like as our report.\textsuperscript{7} Although most of the 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 \textit{P. boydii} isolates and 17 \textit{S. apiosper-
mum} isolates were resistant to amphotericin B and flucytosine. Fluconazole, miconazole, itraconazole and voriconazole have antifungal activity,against \textit{P. boydii}. Among these voriconazole showed the lowest MIC (MIC\textsubscript{50} 0.06 μg/ml and MIC\textsubscript{90} 0.125 μg/ml for \textit{P. boydii}).\textsuperscript{8}

Troke et al., analyzed efficacy of voriconazole in 107 patients with scedosporiosis.\textsuperscript{2} The best ther-
apeutic responses were seen for skin/subcutane-
ous (91\%) or bone (79\%) infections, and the lowest for CNS infections (43\%). Patients without major im-
une suppression (72\%) or those with solid organ transplantation (63\%) or various hematological con-
ditions (60\%) showed the best responses by under-
lying condition. \textit{S. apiospermum} MIC\textsubscript{50}/MIC\textsubscript{90} values for voriconazole 0.25/1.0, itraconazole 0.5/2.0, and amphotericin B 4.0/ >8.0 (2). Our patient was treat-
ed 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.

Especially for critically ill patients, empiric treatment should be started and possible biopsies and other tests have to be done for early diagnosis.

REFERENCES


