A Fatal Infection due to Gordonia Terrae

Jeong Rae Yoo1, Miyeon Kim2, Keun Hwa Lee3, Seung Jin Yoo4, Chang lim Hyun5, Jonghwan Bae6, Sang Taek Heo1 and Yong-Geun Park*6

1Division of Infectious Disease, Jeju National University, Republic of Korea
2Division of Nephrology, Jeju National University, Republic of Korea
3Department of Microbiology, Jeju National University, Republic of Korea
4Chung-Ang University College of Medicine, Seoul, Republic of Korea
5Department of Pathology, Jeju National University, Republic of Korea
6Department of Orthopedic Surgery, Jeju National University, Republic of Korea

*Corresponding author: Yong-Geun Park, M.D., Department of Orthopedic Surgery, Jeju National University School of Medicine, 15, Aran 13 gil, Jeju-si, Jeju Special-Governing Province 690-756, Republic of Korea, Tel: +82-64-717-2710, Fax: +82-64-717-1131, E-mail: pyk184@hanmail.net

Keywords
Mycetoma, Actinomycetoma, Gordonia terrae, Surgery, rRNA sequencing

Mycetoma is a chronic granulomatous, non-contagious disease of the subcutaneous tissues, this most often caused by Nocardia, Actinomyces or fungi [1]. It is endemic in tropical and subtropical areas but not in temperate climates such as South Korea [2]. Among many causative pathogens for mycetoma, Gordonia species, rare nocardioform actinomyces, are difficult to be identified by microbiologic and serologic tests [3,4], because the pathogen requires a precise identification using genomic sequencing [1]. In addition, Gordonia species have been reported in just a few numbers of case series, and its epidemiology and clinical importance have been underestimated [5]. Herein, we report a rare case of mycetoma caused by Gordonia terrae in an immunocompetent patient in a temperate climates area.

A 53-year-old man with a history of poliomyelitis underwent left total hip arthroplasty in December 2011. His past medical history was not significant except the medical conditions described disease. The patient had developed a sore on right perianal area since March 2013 (Figure 1A), and infected sore lesion was extended to abscess on a right buttock abscess since November 2014. However, a few months later, a multifocal erosions and a sinus tract were presented in the same lesion (Figure 1B). The patient was again admitted for drainage in right buttock abscess one year later, it was managed with incision and drainage since November 2014. A few months later, a multifocal erosions and a sinus tract were presented in the same lesion (Figure 1B). The patient was again admitted for drainage in right buttock abscess since November 2014. Consequently, intravenous antibiotics treatment with daily 2 gram of ceftriaxone was initiated and continued for 7 days along with drainage. An initial blood culture result showed no pathogens, but a tissue culture of the wound site identified a penicillin susceptible Streptococcus anginosus and methicillin susceptible Staphylococcus aureus. All laboratory examinations for Mycobacterium tuberculosis, nontuberculous mycobacteria, and fungi were negative. Therefore, intravenous ceftriaxone was switched to intravenous Cefazolin with a daily dose of 6 grams (2 grams three times per day) according to antibiotic susceptibility test. However, the skin lesion continued to deteriorate despite adequate antibiotics trials. Following the result for gram stain of the wound site revealed a gram-positive bacilli, and the colonial morphology showed small and white-colored convex colonies on blood agar (Figure not shown). Furthermore, Corynebacterium species were identified in blood culture using the Vitek II system (bioMerieux Vitek Inc., Durham, NC). Consequently, vancomycin, ceftriaxone and clindamycin combination, and piperacillin/tazobactam were tried to target Corynebacterium species for a total of 4 months during hospitalization due to lack of response. In addition, the patient underwent incision and drainage procedures more than twenty times over the course of hospitalization. Despite medical and surgical treatments, his medical condition did not improve, and the extent of lesion became deeper and wider. Therefore, we decided to identify by 16S rRNA gene sequencing for gram-positive bacilli from blood and wound specimens at the another microbiology and immunology laboratory, the gram-positive bacilli was identified as Gordonia terrae by 16S rRNA gene sequencing (96% match with type strain) using a pair 27FLP (5’-AGAGTTTGATCMTGGCTCAG-3´) and 1492RPL (5’-GGTTACCTTGTTACGACTT-3´) [5,6]. Unfortunately, an antibiotics susceptibility test was not performed due to lack of technological availability at our institution. As reported in previous articles, an antibiotic regimen was changed to a combination of intravenous amoxicillin/subactam and ciprofloxacin for 7 days. Despite changes in antibiotics regimen, his medical condition did not show any improvement, which made us consider...
stream infection and primary bacteremia in immunocompromised hosts, followed by skin and soft tissue infection. Among these reports, only few mycetoma related reports were found. And most of the cases were improved with antibiotic combination treatment with/without surgery. However, in the current case, the patient’s condition led to death despite antibiotic combination treatment and multiple procedures of incision and drainage because firstly antibiotic susceptibility test for \textit{Gordonia} species was not available at our institution, secondly extensive surgical resection was not performed, and lastly \textit{Gordonia} species are frequently misidentified as \textit{Rhodococcus}, \textit{Corynebacterium}, and \textit{Norcardia} by conventional microbiological culture, which may lead to delay in accurate diagnosis [5,12]. Thus, mycetoma caused by \textit{Gordonia terrae} would be consider as one of fatal pathogens causing skin and soft tissue infection.

As stated above, fatal infections by \textit{Gordonia} species are rare disease in infected sore disease and in temperate climate areas. Because it is time consuming to identify \textit{Gordonia terrae} in clinical settings, physicians would be consider a molecular sequencing methods for chronic tumorous granulation tissues and extensive surgical treatments for bulky mycetoma.

**Acknowledgements**

We thank Geun Hwa Lee and collagues for help with 16S rRNA gene sequencing at the department of microbiology and immunology, Jeju National University School of Medicine, Jeju, South Korea.

**Conflict of Interest**

No potential conflict of interest relevant to this article.
References