Roseomonas gilardii Bacteremia from a Peripherally Inserted Central Catheter in a Patient with Endometrial Cancer

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Abstract

Roseomonas gilardii, a Gram-negative, non-motile, non-spore-forming, strictly aerobic, and pink-pigmented coccobacillus, is an uncommon species causing human infection. But, occasionally, it has been reported as a causative organism of opportunistic infection in some countries. We report a case of bacteremia in a 51-year-old woman with endometrial cancer. She visited our outpatient clinic, complaining of cough, headache, and febrile sensation for 3 days after palliative chemotherapy performed 8 days earlier. Cultures of the blood and the peripherally inserted central catheter were performed and bacteria were isolated from cultures after 5 day incubation. Microbiological tests such as Gram staining, culture, and identification testing revealed *Roseomonas gilardii*. The patient was treated with antibiotics for 9 days and discharged. This case of *Roseomonas gilardii* bacteremia from the peripherally inserted central catheter in a patient with endometrial cancer suggests the importance of diagnostic tools for accurate identification of unusual causative organisms of bacteremia in immunocompromised patients. **(J Med Life Sci 2016;6(1):22-24)**

Key Words : *Roseomonas gilardii*, Peripherally Inserted Central Catheter

Introduction

Genus *Roseomonas*, a Gram-negative, non-motile, non-spore-forming, strictly aerobic, and pink-pigmented coccobacillus, is an uncommon species causing human infection. But, *Roseomonas* have been isolated from human sources such as blood, genitourinary sites, wounds, respiratory tract, body fluids, eye, and bone. Most of the isolates have been from blood, and reported as a cause of opportunistic infections such as bacteremia[1-5], cranioplasty infection[6], ventriculitis[7]. Bacteremia is the most common clinical presentation reported in the cases. Although most strains are susceptible to imipenem, tetracycline, and ciprofloxacin, they are rarely susceptible to the penicillins, including the extended-spectrum penicillins and all isolates are resistant to cefepime. So, the rapid and accurate identification of unusual causative organisms like the genus Roseomonas of bacteremia is very important. In some study[8], they revealed that *Roseomonas* species can cause infection in children and adults regardless of immune status. Because different *Roseomonas* species may have different clinical features and susceptibility profiles, molecular studies are necessary to identify *Roseomonas* isolates to the species level. We here report a case of bacteremia caused by *Roseomonas gilardii* in a 51-year-old woman with endometrial cancer.

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Case Report

A 51-year-old woman with endometrial cancer visited our outpatient clinic, complaining of cough, headache, and febrile sensation for 3 days after palliative chemotherapy performed 8 days earlier. She had undergone total abdominal hysterectomy and bilateral salpingo-oophorectomy for endometrial cancer 2 years ago and received chemotherapy and adjuvant radiotherapy for pulmonary metastasis thereafter. Physical examinations and tests revealed fever (38.3℃), low absolute neutrophil count (410/μL), high hs-CRP (10.98 mg/dL), and right lower lung field infiltration on chest radiography. Three sets of cultures for blood and the peripherally inserted central catheter (PICC) were performed and then, bacteria were isolated from PICC culture after 5 day incubation. Conventional microbiological tests such as Gram staining, culture, and identification testing with Vitek 2 cards

(bioMérieux Vitek Inc., Hazelwood, MO., USA) revealed *Roseomonas gilardii*. The antimicrobial susceptibility test was performed by Vitek AST card and determined by CLSI (Clinical and Laboratory Standards Institute) guidelines. Antibiotic susceptibility tests showed susceptibility to amikacin, cefepime, ciprofloxacin, gentamicin, imipenem, levofloxacin, piperacillin, and resistance to ceftazidime. DNAs were extracted using the bead beater-phenol extraction method. A loopful of culture of each isolate was suspended in 200 mL of TEN buffer (10m M Tris - HCl, 1 mM EDTA, 100 mM NaCl: pH 8.0), placed in a 2.0 mL screw-cap microcentrifuge tube filled with 100 mL (packed volume) of glass beads (diameter, 0.1 mm: Biospec Products, Bartlesville, Okla.) and 100 mL of Phenol:Chloroform: Isoamyl alcohol (25:24:1) (SIGMA chemical co. P-2069). To disrupt the bacteria, the tube was oscillated on a Mini-Bead Beater (Biospec Products) for 1 min. To separate the phases the tube was centrifuged (15,000 rpm, 15 min). After the aqueous phase was transferred into another clean tube, 10 mL of 3 M sodium acetate and 250 mL of ice-cold ethanol were added; to enable the DNA to precipitate, the mixture was kept at - 20 ℃ for 30 min. The DNA pellet was washed with 70% ethanol, dissolved in 60 mL of TE buffer (10 mM Tris - HCl, 1 mM EDTA, 100 mM NaCl: pH 8.0) and used as a template for PCR. PCR was performed with a set of primers (Forward primer (285) 5'-GAGAGTTTGATCCTGGCTCAG-3' and Reverse primer (244) 5'-CCCACTGCTGCCTCCCGTAG-3') for amplification of the partial 16S rDNA (350 bp) sequences[9] 50 ng of template DNA and 20 pmol of each primer were added to a PCR mixture tube (AccuPower PCR PreMix; Bioneer, Daejeon, Korea), which contained 1 U of Taq DNA polymerase, each deoxynucleoside triphosphate at a concentration of 250 mL, 50 mM Tris-HCl (pH 8.3), 40 mM KCl, 1.5 mM MgCl2, and gel loading dye. The volume was adjusted with distilled water to 20 mL. The reaction mixture was subjected to 30 cycles of amplification (30 s at 94℃, 45 s at 60℃, and 45 s at 72℃), followed by a 5 min extension at 72℃ (model 9600 thermocycler; Perkin Elmer Cetus). PCR products were electrophoresed on a 1.2% agarose gel and were purified with a QIAEX II gel extraction kit (QIAGEN, Hilden, Germany). For the 16S rDNA analysis, the 16S rDNA sequences were directly determined with the forward and reverse primers of PCR using an Applied Biosystems model 373A automatic sequencer and a BigDye Terminator Cycle Sequencing kit (Perkin-Elmer Applied Biosystems, Warrington, United Kingdom).

Discussion

In 1993, Rihs et al[10] proposed the new genus *Roseomonas*, formerly Known as 'pink coccoid' CDC groups I to IV. Members of this genus are Gram-negative, non-fermentative, pink-pigmented, coccoid rods, similar to Methylobacterium mesophilicum (Pseudomonas mesophilica). This new genus includes three named species, *Roseomonas* gilardii, *Roseomonas* cervicalis and *Roseomonas* fauriae, and three unnamed genomospecies. Although *Roseomonas gilardii* and Pseudomonas mesophilica differ from it on the basis of cellular fatty acid composition, non-vacuolated coccoid morphology on Gram stain, growth at 42℃, growth on MacConkey agar, lack of acetate utilization and lack of acid production from methanol, the members of this genus *Roseomonas* are Gram-negative, non-fermentative, pink-pigmented, coccoid rods, similar to Pseudomonas mesophilica[11]. The natural reservoir of *Roseomonas* is not well known, but, because bacteremia associated with central venous catheters is the predominant presentation, so, potable water and skin are likely. Strict adherence to sterile technique when manipulating the catheter and keeping the insertion site clean and dry should reduce the potential for this opportunistic infection. This genus *Roseomonas* can grow on 5% sheep blood agar, chocolate agar, Sabouraud's agar, and almost always on MacConkey agar. Growth appears as pinpoint, pale-pink, shiny, raised and often mucoid. Most strains are susceptible to imipenem, tetracycline, and ciprofloxacin, they are rarely susceptible to the penicillins, including the extended-spectrum penicillins and all isolates are resistant to cefepime. The drug of choice is gentamicin, until a final identification and susceptibilities are available. Antibiotics alone can fail to clear catheter related sepsis despite achieving therapeutic levels, without catheter removal. In our case, the patient was treated with grasin and cefepime for neutropenic fever for 9 days with PICC removal and discharged with a prescription for oral cefixime. This case of *Roseomonas gilardii* bacteremia from PICC in a patient with endometrial cancer suggests the importance of diagnostic tools for accurate identification of unusual causative organisms of bacteremia in immunocompromised patients.

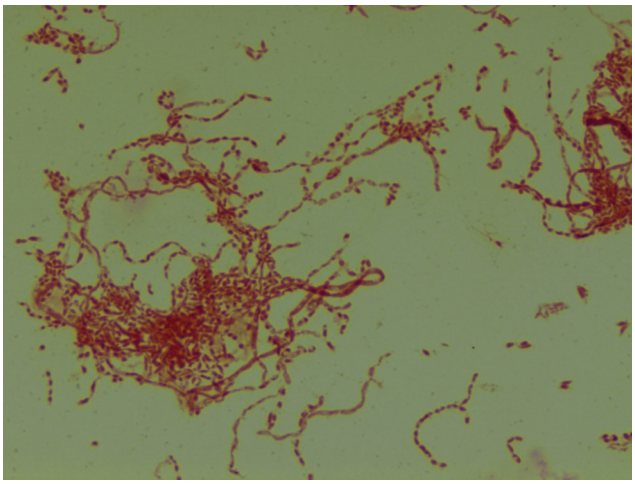

Figure 1. Gram stain shows Gram-negative, non-spore-forming, coccobacillus.

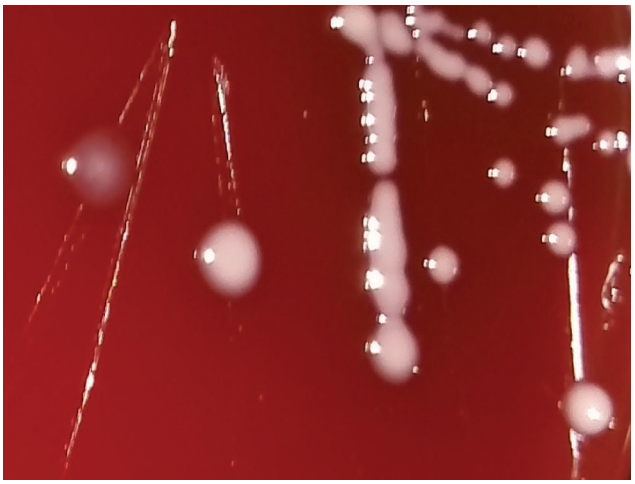

Figure 2. Blood agar plate shows wet, pinkish colonies.

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