Olgu Sunumu
Case Report

Pulmonary Cavitary Lesion Caused by Co-infection of Brevundimonas species and Acinetobacter Johnsonii

AKCİĞERDE KAVİTER LEZYONA NEDEN OLAN BREVUNDİMONAS SPECIES VE ACINETOBACTER JOHNSONII KOENFEKSİYONU

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ABSTRACT

Brevundimonas species are gram-negative, aerobic, and non-fermentative bacilli, which is widespread in the soil and water, and rarely causes infections in human beings. Most of the reported cases of Brevundimonas infection are immunocompromised. However, the isolated Brevundimonas infections were reported in immunocompetent patients too. The most frequent infections caused by Brevundimonas species, were urinary tract infections, bacteremia, septicemia, peritonitis. Lower respiratory infections are fairly rare than the aforementioned infections. Brevundimonas species can also cause coinfection with other microorganisms. Acinetobacter and Brevundimonas coinfection have previously been reported in urinary tract infections but have never been reported in the lung. Here we report an immunocompetent patient with a cavitary lesion in the lung, that was caused by co-infection of Brevundimonas spp and Acinetobacter Johnsonii.

Keywords: Brevundimonas, pneumonia, drug therapy, gram negative, cavitar

ÖZ

Brevundimonas türleri, toprakta ve suda yaygın olarak bulunan ve insanlarda nadiren enfeksiyonlara neden olan gram negatif, aerobik ve fermentatif olmayan basillerdir. Bildirilen Brevundimonas enfeksiyonu vakalarının çoğu immün sistemi baskılanmıştır. Bununla birlikte, izole Brevundimonas enfeksiyonları, immünsuprese olmayan hastalarda da rapor edilmiştir. Brevundimonas türlerinin neden olduğu en sık enfeksiyonlar idrar yolu enfeksiyonları, bakteremi, septisemi, peritonittir. Alt solunum yolu enfeksiyonları, yukarıda bahsedilen enfeksiyonlardan oldukça nadirdir. Brevundimonas türleri ayrıca diğer mikroorganizmalarla birlikte enfeksiyona neden olabilir. Acinetobacter ve Brevundimonas birlikte enfeksiyonu daha önce idrar yolu enfeksiyonlarında bildirilmiş ancak akciğerde hiç rapor edilmemiştir. Burada, Brevundimonas spp ve Acinetobacter Johnsonii'nin ortak enfeksiyonunun neden olduğu akciğerde kaviter lezyonu olan immünsuprese olmayan bir hastayı bildiriyoruz.

Anahtar Kelimeler: Brevundimonas, pnömoni, ilaç tedavisi, gram negatif, kaviter

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Brevundimonas species are gram-negative, aerobic, non-fermentative bacilli, that can cause nosocomial infections in immunosuppressive patients. This microorganism, previously known as Pseudomonas, was reclassified as Brevundimonas following new discoveries in genotype and phenotype in 1994 and was included in the 4th group of Pseudomonas (1-2). Brevundimonas species, usually found in soil, black sand, deep subseafloor sediment, purified water rarely cause infection in human beings (1, 2, 3). The infection with Brevundimonas species was defined in immunocompromised patients rather than immunocompetent patients (1-2). Here we report an immunocompetent patient with a cavitary lesion in the lung, that was caused by co-infection of Brevundimonas species and Acinetobacter Johnsonii.

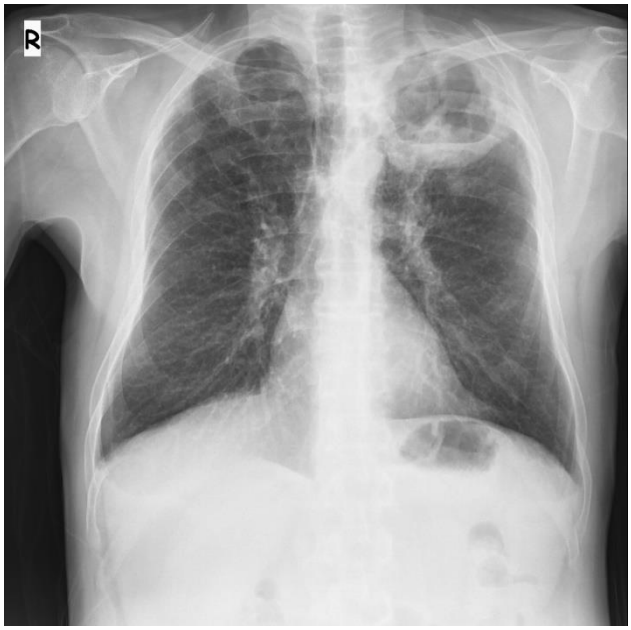
CASE

A 54-year-old male patient admitted to our outpatient clinic with complaints of cough and sputum for 2 months. He had no chest pain, hemoptysis, dyspnea, night sweat, weight loss, and fever. There was nothing remarkable in both his medical history and family history either. He was an immunocompetent patient and he was not using any medication. Written informed consent was obtained from the patient's legal custodian or first-degree relatives for publishing the individual medical records.

Physical examination revealed decreased breath sounds just over the left upper lung. Blood biochemical tests were normal. There was neutrophilic leukocytosis and anemia (Hemoglobine: 10.3g/dl, leukocyte: 24,780/mm3, neutrophil: 20,580/mm3).

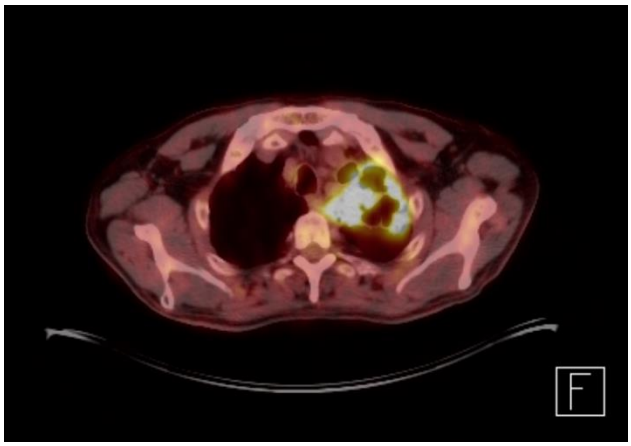
Erythrocyte Sedimentation rate (ESR) and C-reactive protein (CRP) were elevated (ESR: 45mm/hour, CRP: 21mg/dL). A cavitary lesion about 5cm in diameter, was determined in the left upper zone in the chest X-ray (Figure 1).

Figure 1: Chest radiograph on the first admission showing a cavitary lesion about 5cm in diameter, in the left upper zone.



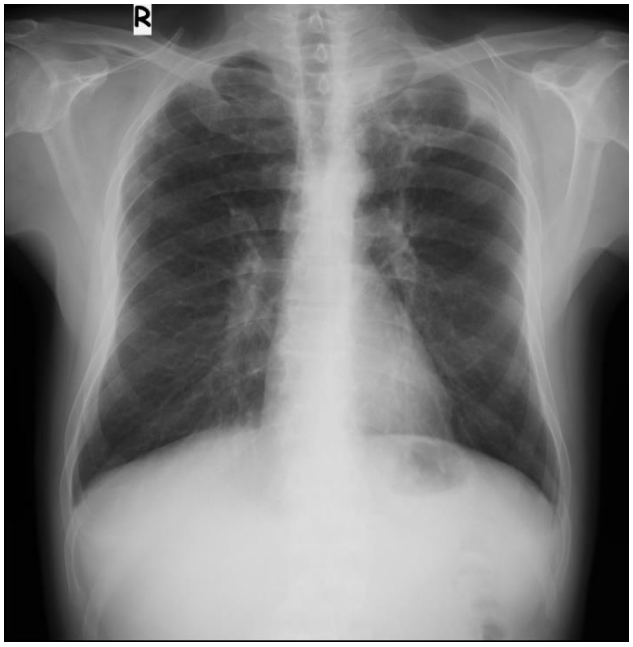
The sputum-tuberculosis panel (AARB, mycobacterium tuberculosis PCR, Tuberculosis culture) was negative. There was a hypermetabolic lesion with soft tissue density in the left upper lobe and multiple hypermetabolic lymph nodes (Figure 2).

Figure 2: Hypermetabolic left upper lobe cavitary lung lesion in PET/CT.



Sputum culture revealed Brevundimonas aurantiaca and Acinetobacter johnsonii by Bruker Biotyper MALDI-TOF MS (Bruker Daltonics, Germany), with a log score of 2.196 and 1.878, respectively. Antimicrobial susceptibility testing results were determined using the BD Phoenix Automated System (BD Diagnostics, Sparks, Maryland) for Brevundimonas aurantiaca and the disk diffusion method for Acinetobacter johnsonii. The Brevundimonas aurantiaca isolate was found to be susceptible to amikacin, gentamicin, imipenem, meropenem, piperacillin tazobactam, and resistant to aztreonam, cefepim, ceftazidime, ciprofloxacin. The patient received intravenous tazobactam 3x4500mg/day for 14 days. At the end of 14 days, the laboratory results were normal and there was a decrease in the diameter of the cavitary lesion. After the discharge from the hospital, the patient had no symptoms, laboratory results were normal, there were not any pathogenic microorganisms in sputum culture and the cavitary lesion was smaller (Figure 3).

Figure 3: Chest radiograph,14 days after discharge from the hospital, with shrinking cavitary lesion.



DISCUSSION

Brevundimonas species, which are classified among the subgroups of Pseudomonas, are ubiquitous in the soil and water, and rarely cause infections in human beings (1, 2, 4, 5, 6). Since it is a rare pathogen of man, what we know about it, comes from the case series. As far as we have learned from these case reports, the age and the immune status of the patients are the two important predisposing factors for Brevundimonas species infections (1,2) It generally arises in immunosuppressive patients, especially those receiving chemotherapy. But also isolated Brevundimonas infection reports in immunocompetent patients are present (5, 7, 8, 9, 10). Nearly half of the patients with Brevundimonas bacteremia had malignancy and forty percent of them had intravascular catheters (5). Malignancy and central venous catheter seem to be possible predisposing factors for the development of this infection (5,8,9). But, our patient had pneumonia caused by Brevundimonas without any obvious predisposing factor.

Co-infection of Brevundimonas species with some other bacterias is also possible. Co-infections with coagulase-negative Staphylococcus in bacteremia, Moraxella osloensis in a catheter infection, Staphylococcus aureus in empyema, Enterococcus sp, Candida tropicalis, and Acinetobacter in urinary tract infection have been reported so far (11,12). In our patient, Brevundimonas Aurantiaca with Acinetobacter Johnsonii were responsible for the pulmonary infection and to the best of our knowledge, this is the first coinfection of Brevundimonas Aurantiaca with Acinetobacter Johnsonii in the lung.

The site and the severity of the infection of Brevundimonas are variable. The most common infections with Brevundimonas species are bacteremia, septicemia, urinary tract infection, and peritonitis. Septic arthritis, keratitis, cutaneous infection, endocarditis, meningitis, tonsilitis, and sometimes sepsis even without any remarkable foci have been reported (1,2,3,4,5,6). Lower respiratory tract infection is fairly rare. So far one empyema, one pleuritis, and two pneumonia cases have been reported (10, 11, 13).

The disease is often not fatal because Brevudimonas species are often susceptible to antibiotics. However, antibiotic susceptibilities can be quite variable. Most of Brevudimonas species are sensitive to aminoglycosides (gentamicin and amikacin), ticarcillin-clavulanate, piperacillin-tazobactam and carbapenems (2, 3, 4, 5, 6]. They may be resistant to first and third-generation cephalosporins (including antipseudomonal antibiotics), colistin, and quinolones [11]. There was a high divergence in the sensitivity to Ciprofloxacin (0-86,4%) and Ceftazidime (3-63.6%). This high divergence in sensitivity may be due to the differences between sensitivity tests and guidelines preferred in the centers. However, considering the reported antibiotic susceptibility to date, if susceptibility testing is impossible in Brevundimonas species infection, we suggest startup with piperacillin-tazobactam.

The most common reasons for cavitary lesions in the apex are tuberculosis and malignancy. Here, in this patient, we also suspected malignancy. On the other hand, his laboratory and radiological findings suggested that infection might also occur. Here we have observed through this case that Brevundimonas infection can also mimic malignancy. Similarly, some cases of mimicking thoracic malignancy have been reported previously (14,15). Fortunately, the sputum culture results of this patient revealed the reason for the radiological findings of the patients, and no surgical procedure was performed because the lesion regressed with the initiation of antibiotherapy.

In conclusion, Brevundimonas species. and Acinetobacter Johnsonii coinfection was found to be the reason for a cavitary lung lesion in a healthy individual without any predisposing risk factor. We have shown for the first time that this microorganism, which usually causes bacteremia, can cause cavitation in the lungs. The most common diagnosis of cavitary lesions in the apex is tuberculosis and malignancy. However, it should be kept in mind that cavitary lesion may be caused by Brevudimonas species as in this case and sputum culture should be obtained from the patients before empirical antibiotherapy is initiated. Thus, successful treatment can be obtained with medical treatment without the need for surgical treatment.

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