

Septic Arthritis Caused by *Rothia dentocariosa* in a Patient with Rheumatoid Arthritis Receiving Etanercept Therapy

To the Editor:

Rothia dentocariosa is a pleomorphic gram-positive rod normally found in the human mouth that has been associated with dental cavities, periodontal disease¹, and, rarely, as a cause of systemic infection^{2,3}.

We describe a case of septic arthritis due to *R. dentocariosa* in a 46-year-old woman admitted to our Rheumatology Unit in December 2008. She had been diagnosed with polyarticular rheumatoid arthritis (RA) 10 years before, and for 2 years arthritis was treated with etanercept (25 mg twice weekly) and oxaprozin. She underwent a meniscectomy and synovectomy of the right knee in March 2008. Tumor necrosis factor (TNF) inhibitor was stopped 2 weeks before and started again 2 weeks after surgery. Levofloxacin was administered for 2 weeks after surgery. Three months later the knee suddenly became swollen and painful. The patient had no fever; laboratory investigation showed only a mild increase of erythrocyte sedimentation rate (ESR; 57 mm/h). Arthritis was diagnosed as a rheumatoid flare and treated with corticosteroid infiltrations, unsuccessfully, with no other therapeutic change.

On admission, examination revealed swelling, pain, redness, and warmth in her right knee with a decreased range of motion. Laboratory data revealed white blood cell count 4290/mm³, hemoglobin 10.4 g/dl, elevated ESR (71 mm/h), but normal C-reactive protein (3.19 mg/dl). Blood cultures were negative.

Anterior and posterior scans (Figure 1) of the knees 6 hours after intravenous injection of ^{99m}Tc-antigranulocyte antibodies (LeukoScan®) showed intense uptake in the right knee. To increase the diagnostic accuracy of scintigraphic evaluation, the same images were acquired 20 hours after injection. The ratio calculated as counts/pixel in the region of uptake of the right knee compared to the contralateral, nonaffected side was increased in the later images (20 h), suggesting an infection⁴. Single photon-emission tomography/computed tomography (SPET/CT) was also obtained at 6 hours after injection. Fused SPET/CT images showed that the areas of uptake corresponded to soft tissues localized in the posterolateral and posteromedial right patellar region and in the right popliteal space (Figure 2), single photon emission tomography

Arthrocentesis was performed and a cloudy synovial fluid (SF) was aspirated (15 cc). Analysis of SF revealed a white cell count of 17,200/mm³

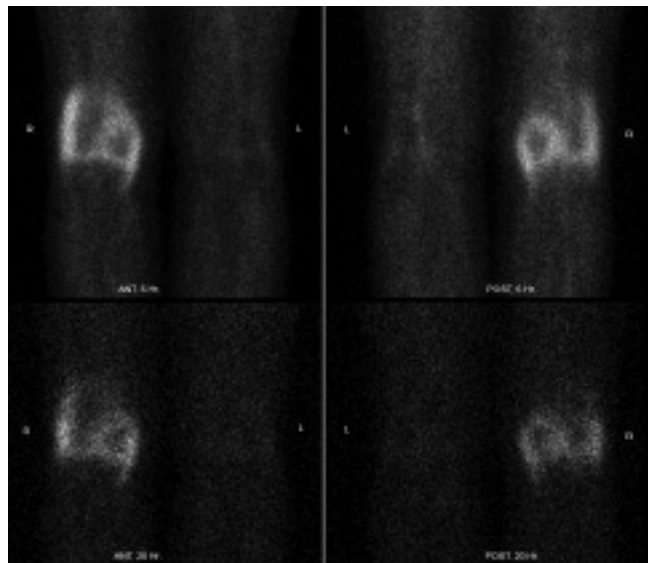


Figure 1. Early (6-hour) and late (20-hour) anterior and posterior views of the knees after intravenous injection of ^{99m}Tc-antigranulocyte antibodies (LeukoScan®). Intense uptake in the right knee is clearly visible in delayed images (corrected for decay), indicating infection.

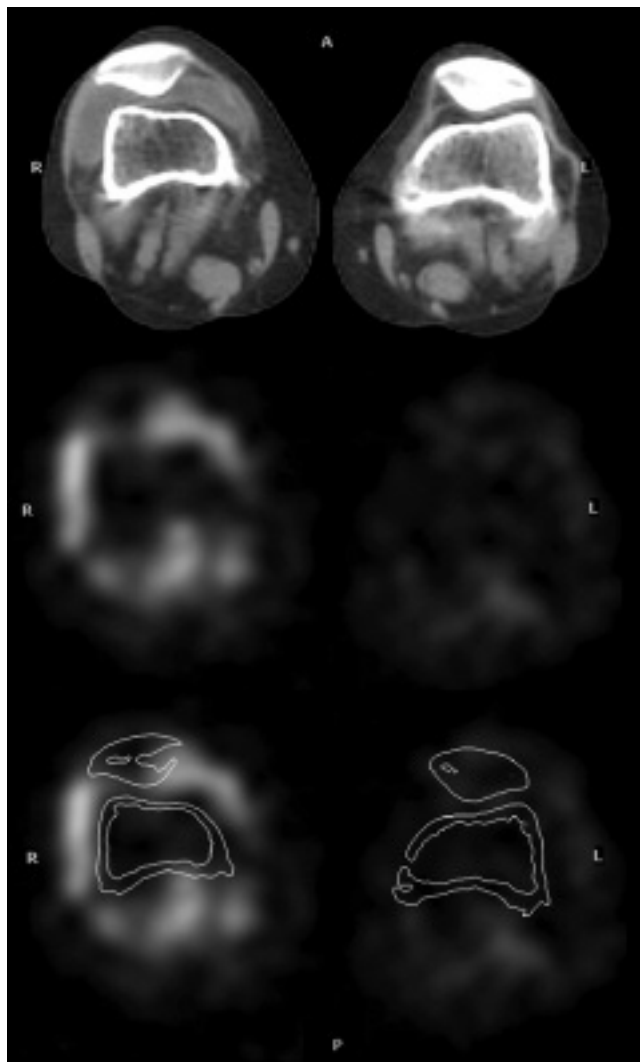


Figure 2. SPET/CT of the knees 6 hours after intravenous injection of ^{99m}Tc-antigranulocyte antibodies. Top panel, CT; middle panel, attenuation corrected transaxial image; bottom panel, attenuation corrected transaxial image with superimposed bone margin. Areas of uptake in SPET correspond to soft tissue.

with 75% polymorphonuclear neutrophils and 25% mononuclear cells. SF culture was positive for *R. dentocariosa*. Questioning revealed that the patient had undergone a tooth devitalization for a deep decay 2 months before admission and 4 months after the knee swelling started. Clarithromycin and levofloxacin were administered and the knee swelling disappeared.

RA is one of the major risk factors for the development of septic arthritis⁵. In addition, the immunosuppressive (disease-modifying antirheumatic drugs and TNF blockers) and steroid therapies and the recent orthopedic surgery of the joint could have played a role in the development of septic arthritis in our patient. Although the role of TNF- α blocker in the development of septic arthritis in this patient is not clear, other infections with unusual pathogens have been reported since these drugs were approved for use in treatment of RA. TNF- α plays a crucial role in the body's defense against bacterial and viral invasion, particularly through the recruitment of neutrophils, eosinophils, and macrophages to the site of infections, as well as enhancing antigen presentation with recruitment and proliferation of T and B cells. A metaanalysis of several randomized trials of TNF- α inhibitors in RA found an increased risk of serious infections in the treat-

ment groups compared to groups receiving placebo or disease-modifying antirheumatic drugs⁶. Finally, the tooth devitalization could have been the cause of septic arthritis. The patient had poor oral hygiene and *R. dentocariosa* is normally detected by molecular analysis in the microflora associated with dental caries⁷. Oral odontopathological flora can cause infectious metastasis following invasive dental procedures, and poor dental hygiene could play a role in infection.

The diagnosis of septic arthritis in patients with RA can be difficult because development of a hot, painful joint is often misdiagnosed as aggravation of the underlying disease, leading to delay in diagnosis of septic arthritis. The superiority of SPET over planar scintigraphy and also of SPET/CT over SPET alone has been proven⁸, especially in delineating correctly the extent of inflammation-infection sites. SPET/CT also improves the accuracy of immunoscintigraphy with antigranulocyte antibodies, allowing correct differentiation between bone and soft-tissue involvement⁹. Further, quantitative analysis of uptake, using early-delayed ratios, proved helpful in differentiating infection from unspecific hyperemia.

To our knowledge a case of septic arthritis caused by *R. dentocariosa* has not been reported previously. Although uncommon, *R. dentocariosa* should be regarded as a potential cause of septic arthritis in patients with RA and poor oral hygiene treated with TNF- α inhibitor.

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