five patients had samples that were negative by IFA; samples from two patients were not evaluated by IFA. The samples from all three PCR-negative patients were IFA negative.

Of the six patients whose samples were positive by both IFA and PCR, four had a positive IFA titer (for three patients, titers increased from 1:32 to 1:128; for one patient, 1:64 to 1:256) of antibody to *L. pneumophila*, whereas the other two patients had antibodies to *L. bozemanii* and *L. dumoffii* on IFA (table 1). However, for these two patients, the second highest titer obtained (1:64) was for antibody to *L. pneumophila* serogroup 1. Therefore, these two patients must have been infected by two kinds of *Legionella* species, otherwise the titer of serum antibody would have risen because of a cross-reaction caused by infection due to *L. pneumophila* serogroup 1. We regret that we could not test these samples by DFA.

Among the eight patients tested by DFA, only two had a positive reaction. Three or four typical bacteria with bright cell-wall fluorescence (stained with both polyclonal and monoclonal staining reagents) were observed only in the samples diluted 10 times (these cells were not observed in the undiluted samples and those diluted 100 times). The other patients' samples could not be examined, as the presence of impurities made it impossible to decide whether or not *L. pneumophila* organisms were present. Further investigation with use of more samples will be necessary to evaluate the usefulness of PCR for detecting legionellosis.

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References


Coexistence of Pseudogout and Arthritis Due to *Actinobacillus actinomycetemcomitans*

The coexistence of calcium pyrophosphate dihydrate (CPPD) crystal deposition disease (pseudogout) and infectious synovitis should always be considered in patients with joint disease, especially those who are elderly. Routine synovial fluid cultures are necessary to rule out a diagnosis of septic arthritis. Herein, we report a case of *Actinobacillus actinomycetemcomitans* arthritis that was associated with pseudogout.

A 67-year-old man with a 4-day history of swelling in the right knee was referred to our outpatient clinic. His medical history was significant for implantation of an aortic valve prosthesis because of aortic stenosis. On physical examination the knee was found to be swollen and warm without erythema. Fever, chills, or other signs of infection were absent. Arthrocentesis yielded 35 mL of an inflammatory fluid with 59,000 cells/mm³ (90% neutrophils). Numerous weakly positive birefringent crystals were identified in the fluid on examination by compensated polarized light microscopy.

Laboratory analyses showed a white blood cell count of 9,200/mm³, a hemoglobin level of 14.9 g/dL, a hematocrit of 44.7%, a platelet count of 303,000/mm³, and an erythrocyte sedimentation rate of 34 mm in the first hour. Results of routine biochemical studies were normal. Radiographs of the knees revealed soft-tissue swelling, joint effusion, and osteoarthritic changes.

Chondrocalcinosis was detected in the limbus acetabuli and the pubic symphysis. CPPD crystal deposition disease was diagnosed, and treatment with indomethacin and colchicine was instituted.

Three days later, the patient was admitted to our hospital because of a gastric hemorrhage. At that time, prophylaxis for infective endocarditis was initiated. Two days after admission a culture of the synovial fluid on chocolate agar incubated at 36°C in 5% CO₂ for 120 hours yielded punctate and firmly adherent colonies. The organism was identified as *A. actinomycetemcomitans* on the basis of its morphological and biochemical characteristics: it was catalase positive, oxidase negative, urease negative, and indole negative; fermented glucose and maltose but not lactose or sucrose; reduced nitrate to nitrite; failed to grow on MacConkey agar; and did not require either factor X or factor V for growth.

The strain was found to be susceptible to ampicillin, cefotaxime, ciprofloxacin, rifampin, and tetracycline by the disk diffusion method [1]. The MICs of ampicillin and cefotaxime, determined by the E-test method in Haemophilus Test Medium agar (Becton Dickinson, Meylan, France) [2], were 0.75 μg/mL and 0.047 μg/mL, respectively. An echocardiogram showed a normally functioning prosthesis without valvular vegetations. Blood cultures performed after administration of prophylaxis for endocarditis were negative. Examination of the patient's oral cavity revealed numerous carious teeth and marked periodontitis. Needle aspiration of the joint was performed, and he was treated with intravenous amoxicillin plus clavulanate for 3 weeks; he completely recovered. On discharge, he was instructed to take oral ciprofloxacin for an additional 3 weeks.

*A. actinomycetemcomitans* is part of the normal flora of the oral cavity. The organism has been implicated as the etiologic agent in several processes including periodontal disease, endocarditis, soft-tissue abscesses, and, infrequently, brain abscesses, pneumonia, pericarditis, osteomyelitis, synovitis, tenosynovitis, urinary tract infections, and empyema [3]. Almost all infections caused

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by *A. actinomycetemcomitans*—except those in the oral cavity—are produced by hematogenous spread of periodontal infection. Poor dentition, recent dental manipulation, or carious teeth have commonly been noted in patients with *A. actinomycetemcomitans* infection [3]. Infectious arthritis due to this pathogen has been exceptionally documented [4].

*A. actinomycetemcomitans* is a fastidious, nonmotile, nonencapsulated, small gram-negative cocobacillus that requires 5%-10% CO₂ for growth [5]. It is usually susceptible in vitro to aminoglycosides, chloramphenicol, tetracycline, and cephalosporins; thus the choice of therapeutic agents for treatment of infection due to this organism is based on the results of these tests.

Pyrophosphate crystals are a frequent cause of joint disease. Coexistent infective arthritis has been reported in ≤10% of patients with CPPD crystal arthritis [6]. Proinflammatory enzymes, which are released in the joint as a result of the septic process, are the supposed origin of the pyrophosphate crystals in the joints. In some cases, preexisting damage to the joint is a risk factor that contributes to bacterial proliferation. *A. actinomycetemcomitans* had not been previously associated with pyrophosphate arthritis.

Our patient’s risk factors for *A. actinomycetemcomitans* infection were numerous carious teeth and periodontitis. The presence of weakly positive birefringent crystals in the synovial fluid, the absence of signs of infection, and the slow growth of the organism delayed diagnosis. Fever and leukocytosis are common findings in patients with septic arthritis, but these signs may be absent. Moreover, these signs are frequently associated with CPPD crystal arthritis, thereby increasing the difficulty of making a correct diagnosis. We emphasize the importance of performing synovial fluid cultures in all cases of microcrystalline arthritis; these cultures require a long incubation period to exclude slow-growing microorganisms.

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**References**


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**Tumor-Like Pyomyositis of the Thigh Caused by *Yersinia enterocolitica***

*Yersinia enterocolitica* is normally an enteric pathogen [1] that rarely causes primary infections of the muscles [2, 3]. We describe a case of pyomyositis due to *Y. enterocolitica*.

A 77-year-old man was admitted to our hospital in April 1993 with a 2-month history of fever (temperature, 38.5°C) and a painful, growing mass in the left thigh. His medical history was remarkable for traumatic rupture of his left quadriceps tendon in 1938, a nonmetastatic renal adenocarcinoma in 1989, and insertion of a left hip prosthesis in 1992. The patient denied having had trauma, contact with animals, rashes, joint swelling, or diarrhea and reported no recent travel or special dietary habits. He did not have diabetes mellitus or any metabolic disorders.

Physical examination revealed fever and a palpable mass that was located in the anterior left thigh. No other physical abnormalities were detected. The leukocyte count was 11,500/mm³ with 80% neutrophils. MRI showed a heterogeneous tumor containing several calcifications in the quadriceps muscle; no bony involve-

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