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An Unusual Case of Knee Pain: Pseudogout and *Abiotrophia defectiva* Infection

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Abstract

90-year-old man was diagnosed with monoarticular arthritis due to pseudogout and *Abiotrophia defectiva* infection. *A. defectiva* is recognized as a cause of endocarditis, but is rarely described in septic arthritis. To our knowledge, this is one of the few case reports of septic arthritis due to this organism, and the first in association with pseudogout. This report supports the routine culture of synovial fluid and is further evidence for the role of *A. defectiva* in septic arthritis.

Keywords

Abiotrophia defectiva; septic arthritis; calcium pyrophosphate disease; pseudogout; endocarditis

The etiology of pain and swelling in articular joints includes infection, crystal arthropathy, hemarthrosis, rheumatologic disease, and osteoarthritis, with most occurring in isolation. We present the case of a 90-year-old male who developed acute monoarticular arthritis. Initial evaluation demonstrated calcium pyrophosphate dihydrate (CPPD) crystals, and cultures later revealed *Abiotrophia defectiva* infection. To our knowledge, this is the first reported association of these two entities.

Case Report

A 90-year-old man presented to the emergency department complaining of left knee pain. He was found to have prepatellar swelling and tenderness of the joint. He was afebrile and had no joint erythema or warmth. Knee films demonstrated degenerative changes and a small effusion. The patient declined arthrocentesis, and was discharged with pain medications.

Three days later he presented with increased pain, swelling, and an inability to flex or extend his knee. He had a low-grade fever at 99.6°F and a larger knee effusion. He was tender to palpation and his range of motion was limited. At arthrocentesis, 60 cc of straw-colored fluid was aspirated. Laboratory analysis demonstrated 15,000 white blood cells (WBC) with 82% neutrophils, a negative Gram stain, and CPPD crystals consistent with acute pseudogout. He was started on a prednisone taper.

A week later, synovial fluid cultures were positive for *A. defectiva*. Follow-up blood cultures also grew *A. defectiva* and he was admitted for further work up. History revealed a dental

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Brief Description of Manuscript: 90-year-old man was diagnosed with monoarticular arthritis due to pseudogout and *Abiotrophia defectiva* infection. *Abiotrophia defectiva* is a recognized cause of endocarditis but is rarely noted in septic arthritis. This case emphasizes routine culture of joint aspirates and reviews the work up and treatment of *Abiotrophia defectiva*.

procedure two months prior to the onset of his symptoms. He remained afebrile, had a normal cardiac exam, and no peripheral stigmata of endocarditis. His admission WBC was 8,900/ μ L, and his sedimentation rate was 38 mm/hr. His knee remained swollen, and an arthrocentesis done three days after starting levofloxacin demonstrated 5,250 WBC with 83% neutrophils, a negative Gram stain, and CPPD crystals. Although a transthoracic echocardiogram demonstrated no valvular vegetations, it was presumed that he had underlying endocarditis due to his prolonged bacteremia and the organism's proclivity for causing endocarditis. He was discharged on oral levofloxacin and intravenous (IV) ceftriaxone with plans to complete six weeks of therapy. Subsequent blood cultures were negative and his knee pain and swelling resolved.

Discussion

Abiotrophia defectiva was formerly classified as a nutritionally variant streptococcus (NVS) and is found in the normal flora of the respiratory, urogenital and gastrointestinal tracts. NVS were described in 1961 as Gram-positive cocci that grew as satellite colonies around other bacteria, primarily *Staphylococcus aureus*.¹ While *Abiotrophia* and other former NVS can be grown by routine blood cultures, they are recognized in the laboratory for their fastidious nature, requiring pyridoxal or thiol group supplementation for growth.²

A. defectiva has been implicated in a variety of infections, and along with other formerly classified NVS, may cause up to 4% of bacterial endocarditis.³ Musculoskeletal infections with *A. defectiva* are rare, but among those described are cases associated with underlying endocarditis.⁴⁻⁶ Treatment for *Abiotrophia* infections remains controversial. Since in-vitro susceptibility testing may not correlate well with clinical effectiveness, therapy can be difficult and associated with high relapse rates.^{6,7} According to the American Heart Association guidelines, *A. defectiva* endocarditis should be treated with a regimen recommended for enterococcal endocarditis: IV penicillin or vancomycin plus an aminoglycoside for at least four to six weeks.⁸ Since musculoskeletal infections with *A. defectiva* are rare, there are no specific recommendations for treatment.

Dual diagnoses are uncommon in monoarticular arthritis, but infection can be a complication of crystal arthropathy. The diagnosis of concomitant crystal and infectious arthritis can be challenging, as infection presents in only 1.5% of joint aspirates containing crystals,⁹ and patients may present without fever.¹⁰ Crystal arthropathy is also associated with high synovial WBC counts, and the discovery of crystals can lead to a delay in diagnosis and antibiotic therapy. This case illustrates the importance of culture in the work up for any new joint effusion. In our case, culture of *A. defectiva* led to the early diagnosis of septic arthritis and endocarditis, possibly preventing major morbidity associated with this infection.

Conclusion

The development of joint pain and effusion warrants thorough evaluation by arthrocentesis. Our case illustrates the importance of routine culture to rule out concomitant infection in crystal arthropathy. While the majority of joint infections are due to *S. aureus* or streptococcal species, fastidious organisms such as *A. defectiva* should remain in the differential. If this infection is identified, thorough investigation to rule out endocarditis or other endovascular infection is indicated.

Key Points

- Joint pain with effusion warrants arthrocentesis and synovial fluid analysis for cell counts, crystals, Gram stain and culture.

- In crystal arthropathy, cultures of synovial fluid are important to rule out concomitant infection.
- A search for an endovascular source is essential for *Abiotrophia defectiva* bacteremia or septic arthritis, as rates of endocarditis are high.
- With no standard treatment recommendations for *A. defectiva* musculoskeletal infections, consultation with an infectious diseases expert is recommended.

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