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CLINICAL VIGNETTE

Septic Arthritis after Intra-Articular Steroid Injection

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Introduction

A 92-year-old man presented to his primary care physician with a week of worsening right shoulder pain. One week prior to presentation, he underwent bilateral intra-articular shoulder injections and supra-scapular nerve blocks under fluoroscopy by pain management for bilateral shoulder pain. Past medical history was significant for hypertension, atrial fibrillation, congestive heart failure, chronic kidney disease, osteoarthritis of the shoulders and knees, rotator cuff disease, lumbar spinal stenosis, and osteoporosis.

At time of presentation, physical exam was notable for a one to two centimeter area of fluctuance near the acromion. He was admitted for soft tissue infection and possible septic arthritis and started on antibiotics. The following day, he underwent fluid collection aspiration by interventional radiology. There was a 1.4 x 5.3 x 4.9 centimeter fluid collection involving the acromioclavicular and glenohumeral joints. Aspirate gram stain was positive for gram-positive rods. The next day, he underwent irrigation and drainage of acromioclavicular joint by orthopedic surgery. Blood cultures obtained on admission and aspirate cultures obtained returned positive for *Corynebacterium striatum*. Antibiotics were changed to penicillin G infusion. Four days later, blood cultures done two days prior were positive for gram-negative rods, which later were identified as *Pseudomonas aeruginosa*, and the patient was started on piperacillin-tazobactam. Four days later, the patient was discharged home on the following: penicillin G infusion for four weeks duration starting from the date of the irrigation and drainage for *Corynebacterium striatum* septic arthritis and ciprofloxacin orally for 14 days from the date of the first negative blood culture for *Pseudomonas bacteremia*.

Discussion

Septic arthritis is an uncommon but potentially serious side effect of intra-articular joint injection. Based on a survey of rheumatologists, the estimated risk is 4.6 cases/100,000 injections.¹ Of the 40 rheumatologists interviewed with an average of 14 years in practice, five of the rheumatologists

recalled one such case, while another five recalled two or more cases.¹ A review by Gray et al² estimated the risk as fewer than two cases/100,000 injections. Geirsson et al³ identified 33 cases of septic arthritis after arthrocentesis in Iceland between 1990 and 2002. In this study, orthopedists, rheumatologists, and general practitioners performed nearly 8000 intra-articular injections per year, and the incidence of septic arthritis after arthrocentesis was calculated as 0.037%. Septic arthritis after intra-articular steroid injection tends to be more common in men than women and in older adults. In Geirsson et al³, the male to female ratio was 2 to 1, and mean age was 63 years. Risk factors include diabetes mellitus, immunosuppression, and rheumatoid and osteoarthritis. Degenerative joint changes seen in arthritis may make joints more susceptible to infection.

The risk of septic arthritis with each procedure has remained constant over time; however, the total incidence of septic arthritis has increased with higher rates of intra-articular procedures.³ The mean annual incidence rate of iatrogenic septic arthritis from arthrocentesis, arthroscopy, and joint replacement increased from 2.8 cases/year between 1990 and 1994 to 9 cases/year between 1998 and 2002 (p 0.01).³ Incidence of septic arthritis was correlated (p 0.01)³ with use of intra-articular steroids.

The presumed cause of septic arthritis after intra-articular steroid injection is due to bacteria from the skin's surface entering the joint space directly with insertion of the needle. Also, trauma from instrumentation may make the joint more susceptible to hematogenous spread. Septic arthritis can occur not only with intra-articular steroid injection but also with peri-articular steroid injection. Rhee et al⁴ reported on 13 patients who had been referred to an orthopedics clinic and underwent surgery for injection-induced glenohumeral septic arthritis. In this case series, injections were performed for adhesive capsulitis, degenerative arthritis, rotator cuff tear, and undiagnosed shoulder pain with site of injection including the subacromial space, the biceps tendon, and the subdeltoid space. Steroids were administered to 10 of the 13 patients. Symptoms of septic arthritis, as in our case and the Rhee et al⁴ case series, usually develop within one to three weeks.

Pathogens typically are staphylococcal and streptococcal species and less commonly other species. A minority of cultures do not identify a pathogen. Of the 33 cases of septic arthritis cases after arthrocentesis identified in the Geirsson³ study, cultures were 49% (16) coagulase-positive staphylococci, 21% (7) coagulase-negative staphylococci, 9% (3) streptococci, 9% (3) other, and 12% (4) negative.

Corynebacterium septic arthritis after intra-articular steroid injection is rare but one case of *Corynebacterium striatum* subacromial bursitis and glenohumeral septic arthritis after steroid injection in a middle-age immunocompetent adult has been reported.⁵

While the majority of patients recover from septic arthritis after intra-articular steroid injection; the clinical course can be complicated with multiple surgeries and long antibiotic courses. For some patients, it can be deadly. Yangco et al⁶ describe a fatal case of *Escherichia coli* and *Clostridium* gas gangrene after intra-articular steroid injection of the glenohumeral joint. Shemesh et al⁷ describe one case of methicillin-sensitive *Staphylococcus aureus* septic arthritis after intra-articular steroid injection leading to above-knee amputation, sepsis, and death.

Although uncommon, septic arthritis potentially is a serious side effect of intra-articular steroid injection, which highlights the importance of performing intra-articular steroid injections only if potential benefits outweigh potential risks and taking precautions to minimize risk of infection.

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