

Simultaneous bilateral septic arthritis of the knee after intraarticular steroid injection: A clinical report

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Abstract

Osteoarthritis of knee is one of the common problems in elderly population. Intraarticular corticosteroid injection is a conservative management modality in osteoarthritis of knee. Septic arthritis is an infective complication of intraarticular corticosteroid injection. Septic arthritis in rheumatoid arthritis patients have worse prognosis because of delay in diagnosis. A higher rate of infectious complications following intraarticular injection is expected in immunocompromised and rheumatoid patients. We would like to report an extremely rare case of simultaneous bilateral knee septic arthritis after bilateral knee intraarticular steroid injection in a rheumatoid arthritis patient. Patient was treated successfully with multiple bilateral knee arthroscopic washouts and long-term intravenous antibiotics. This case report emphasizes the increased risk of infection in rheumatoid arthritis patients and a risk benefit assessment on individual basis before carrying out intraarticular steroid injection. Patient should be aware of this increased risk of infection.

Key words: Corticosteroid injection, intraarticular injection, knee arthritis, rheumatoid arthritis, septic arthritis

INTRODUCTION

Osteoarthritis of the knee is a common problem in the elderly patients with a lifetime risk of symptomatic knee osteoarthritis approaching 45%.^[1] Intraarticular corticosteroid injection is a common conservative management modality in treatment of osteoarthritis of knee. Bellamy *et al.*^[2] in 2008 showed a well-established short-term benefit with intraarticular corticosteroid injection in treatment of knee osteoarthritis with some side-effects. Septic arthritis of knee is one of the known complications of intraarticular corticosteroid injection. The incidence of septic arthritis of knee after intraarticular corticosteroid injection ranges from one in 3000 to one in 50,000 and may be higher in immunocompromised patients.^[3] The treatment of iatrogenic septic arthritis necessitates multiple joint washout and debridement, long-term antibiotic therapy and prolonged inpatient hospital stay. A higher rate of infectious complications following intraarticular injection can be expected in immunocompromised patients.^[4]

We would like to report an extremely rare case of simultaneous bilateral septic arthritis of knee as a result of intraarticular corticosteroid injection to both knees in a rheumatoid arthritis patient with end stage renal disease on dialysis. To the best of our knowledge, this has not been reported before in the literature.

CLINICAL REPORT

A 66-year-old male patient was admitted to hospital under the medical team for investigation of recent unexplained weight loss of approximately one stone in 6 months. He has a background of rheumatoid arthritis for the past 30 years. He was on hemodialysis for end stage renal failure. Other comorbidities included hypertension and coronary artery disease. Patient had severe bilateral arthritis of both knees that was being treated conservatively by the rheumatologist. As a part of his conservative management, the patient received bilateral knee intraarticular corticosteroid injections. A combination of 80 mg of methylprednisolone and 8 ml of 1% lignocaine was injected into each knee under aseptic precautions. After 6 days, the patient complained of severe bilateral knee pain and was unable to weight bear. Slightest movement of knee aggravated the pain. Patient also complained of chills and rigors with intermittent fever. After 2 days, his both knees were aspirated revealing purulent fluid, which was sent to microbiology for culture and sensitivity. He was referred to the orthopedic service for review.

On examination, he was febrile with a temperature of 38.2°C and tachycardic. Patient was unable to weight bear. Examination of both knees revealed local increased temperature, tenderness on palpation of the patello-femoral joint, medial and lateral joint line. A large effusion was noted in both knees; left knee more than the right with a painful decreased range of

movements in both knees. The inflammatory markers were raised with a white cell count of $35.19 \times 10^9/L$, neutrophil count of $33.27 \times 10^9/L$, erythrocyte sedimentation rate 159 mm at the end of 1 h and C-reactive protein 465. Anteroposterior view [Figure 1] and lateral views [Figures 2 and 3] of bilateral knee radiographs showed advance osteoarthritis in both knees with large effusions. History, clinical examination and laboratory findings were highly suggestive of simultaneous bilateral septic arthritis of the knees secondary to intraarticular steroid injections. Patient was taken to the operating theatre for arthroscopic washout and debridement of both knees. 270 ml of frank pus was drained from left knee while 120 ml drained from right knee. A thorough debridement was performed and both knee joints were washed out with 6 L of normal saline. The fluid from both knees and tissue samples taken were sent for culture and sensitivity. Patient was commenced empirically on intravenous flucloxacillin 2 g 4 times daily and fucidic acid 500 mg twice-a-day. Culture and sensitivity revealed *Staphylococcus aureus*, which was sensitive to flucloxacillin. Antibiotics were continued for 6 weeks. Arthroscopic washout and debridement was repeated twice subsequently. 6 weeks post-operatively white cell count and inflammatory markers had normalized and articular symptoms had resolved. Patient has given the consent for this case report to be published.

DISCUSSION/CONCLUSION

Bellamy *et al.*^[2] in 2008 showed a well-established short-term benefit with intraarticular corticosteroid injection in the treatment of knee osteoarthritis with some side-effects. Septic arthritis of knee is one of the known complications of intraarticular corticosteroid injection. Septic arthritis of knee in rheumatoid arthritis is a well-recognized complication. Septic arthritis in rheumatoid patients has worse outcomes when compared with normal people primarily because of the delay in diagnosis.^[5] This delay in diagnosis occurs because the painful and hot joints can be often confused with exacerbations of rheumatoid arthritis.^[6] Blackburn *et al.*^[7] in their study reported that there was an average delay of 13.7 days in diagnosing septic arthritis in rheumatoid arthritis patients. The diagnosis was often made by chance during an intraarticular injection or arthrogram.^[5] Ultrasound guided arthrocentesis is a key to success in aspirating difficult joints such as shoulder or hip joint. Microscopic analysis and culture and sensitivity of the aspirated synovial fluid are the most accurate tool in the diagnosis of septic arthritis.^[8] Magnetic resonance imaging (MRI) is another useful modality in diagnosing septic arthritis as MRI allows the delineation of soft-tissue infection and osteomyelitis.^[9]

Increased susceptibility of infection in rheumatoid arthritis was caused by defective phagocytosis in blood and synovial fluid.^[10] Previously, Turner *et al.*^[10] and Wilton

et al.^[11] postulated that increased susceptibility to infection in rheumatoid arthritis is because of abnormal immune complexes and polymorphonuclear cell function but Breedveld *et al.*^[12] failed to show defect in phagocytosis of polymorphonuclear cells and found that intracellular killing of *S. aureus* was intact in polymorphonuclear cells present in synovial fluid and peripheral blood. An animal study carried



Figure 1: Anteroposterior radiograph of bilateral knee showing advance osteoarthritis in both knees with large effusions



Figure 2: Lateral radiograph of left knee showing advance osteoarthritis in the knee with large effusion



Figure 3: Lateral radiograph of right knee showing advance osteoarthritis in the knee with large effusion

out by Mahowald^[13] concluded that infection rapidly extends in rheumatoid arthritis joints along the pannus to the subchondral bone. Subchondral neovascularisation carries the bacterial load into the subchondral bone and blocks the vasculature leading to subchondral bone and synovial ischemia.^[13] Inhibition of tumour necrosis factor alpha has been implicated as one of the risk factors for increasing the chances of infection in rheumatoid arthritic joint.^[14]

The incidence of septic arthritis of knee after intraarticular steroid injection varies between one in 3000 and one in 50,000.^[3] In rheumatoid patients on long-term immunosuppressive treatment, this raises to one in 2000 within 3 months of intraarticular injection.^[4] Skin is the most common source of infection in rheumatoid patients, which accounts for 75% of the infection.^[9] Skin in rheumatoid patients is vulnerable because of rheumatoid nodules and ulcerated callus in rheumatoid foot.^[9] Lung, urinary tract and gastrointestinal tracts are other sources of infection.^[9] *S. aureus* infection occurs after connective tissue degradation in the soft-tissue. *Staphylococcus* septic arthritis is most common in rheumatoid arthritis.^[7] *S. aureus* is a strong inducer of various matrix metalloproteinases in human synovial fibroblasts. These induced matrix metalloproteinases causes rapid destruction of the joint.^[15] Other group of organisms like *Streptococcus pneumoniae*, Group B, C, G *Streptococcus*, Gram-negative bacilli, *Hemophilus* have been reported to cause septic arthritis in rheumatoid arthritis patients.^[9]

Once the diagnosis of septic arthritis is established prompt arthrotomy, aggressive debridement, surgical drainage and commencement of appropriate antibiotic therapy according to culture and sensitivity is an acceptable treatment. Arthroscopic drainage and washout have shown good results. Gram-positive cocci are treated with vancomycin or third generation cephalosporin, whereas Gram-negative organisms are treated with third generation cephalosporin and an aminoglycoside.^[5] Mortality in polyarticular septic arthritis in rheumatoid arthritis is as high as 50%.^[5,9] Mortality decreases to 15% with monoarticular septic arthritis in same group of patients. Goldenberg and Reed^[5] reported that outcome of septic arthritis in rheumatoid arthritis patient is worse than a non-rheumatoid patient. The chances of recurrence of sepsis are more common in rheumatoid patients compared to patients without rheumatoid arthritis.^[9]

This rare case of bilateral knee septic arthritis after intraarticular steroid injection in a rheumatoid arthritis patient has not been previously described in the literature and emphasizes the increased risk of infection in these patient groups. This increased risk of septic arthritis in rheumatoid arthritis patient requires risk benefit assessment on individual basis before carrying out intraarticular steroid injection and patient should be aware of the increased risk posed with it.

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