

## Case report

## Rapid destructive osteoarthritis of the hip after intra-articular steroid injection

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## ABSTRACT

Rapid destructive osteoarthritis of the hip is a separate entity different from the usual osteoarthritis. It is usually seen in elderly women, and the characteristic feature is the rapid progression within 6 to 12 months to complete destruction of the joint. The exact etiology is not known. We present a rare case of rapid destructive osteoarthritis of the hip in a 62-year-old woman who developed it within 2 months of intra-articular steroid injection, which was managed well with uncemented total hip arthroplasty. Through this report, we emphasize the possibility of the disastrous complication of injection, which should be informed to the patient before any intra-articular injection.

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## Introduction

Rapid destructive osteoarthritis (RDO) of the hip is a rare syndrome, consisting of rapid joint degeneration and destruction typically involving both the femoral head and acetabulum. It was first described by Forestier [1] in 1957, and its etiology and pathogenesis still remain unclear [2,3], but few studies suggest a causal relationship, such as direct toxicity by drugs, subchondral osteonecrosis and ischemia, and immunological mechanisms mediated by cytokines.

This entity is rarely seen in the orthopaedic practice and seldom reported in the literature, making it is difficult to suspect. We present a rare case of RDO in a patient who presented with complete destruction of the joint within 2 months after intra-articular injection of a steroid.

## Case history

A 62-year-old woman presented to our clinic with severe pain in the right hip for 3 months. Pain was severe and located in the anterior aspect of the right groin. The pain was insidious in onset and progressive in nature, which aggravates with movements of the joint. She was unable to bear full weight on the right limb because of this pain. She had a right hip steroid injection ordered by a physician from an outside hospital 2 months prior, which did not significantly relieve her pain, which increased in intensity after few days of injection. She had no prior surgery on the right hip. The patient's past medical, surgical, and social histories were unremarkable. Family history was found to be noncontributory.

There was no history of fever, changes in weight, loss of appetite, burning micturition, chest pain, and any other musculoskeletal complaints. Examination revealed tenderness in the right groin, restricted and painful movements, and shortening of 3 cm in the right limb. A radiograph of the pelvis—conducted before the injection—revealed minimal joint space narrowing that is suggestive of mild osteoarthritis (Fig. 1). The repeat radiograph after 2 months of injection showed the complete destruction of the femoral head with proximal migration and minimal osteophytes around the joint that is suggestive of RDO of the hip (Fig. 2). Destructive changes were also seen in the acetabulum. Contralateral hip was normal. Complete blood count, erythrocyte sedimentation rate, and C-reactive protein were all within normal limits. Joint aspiration, microbiological

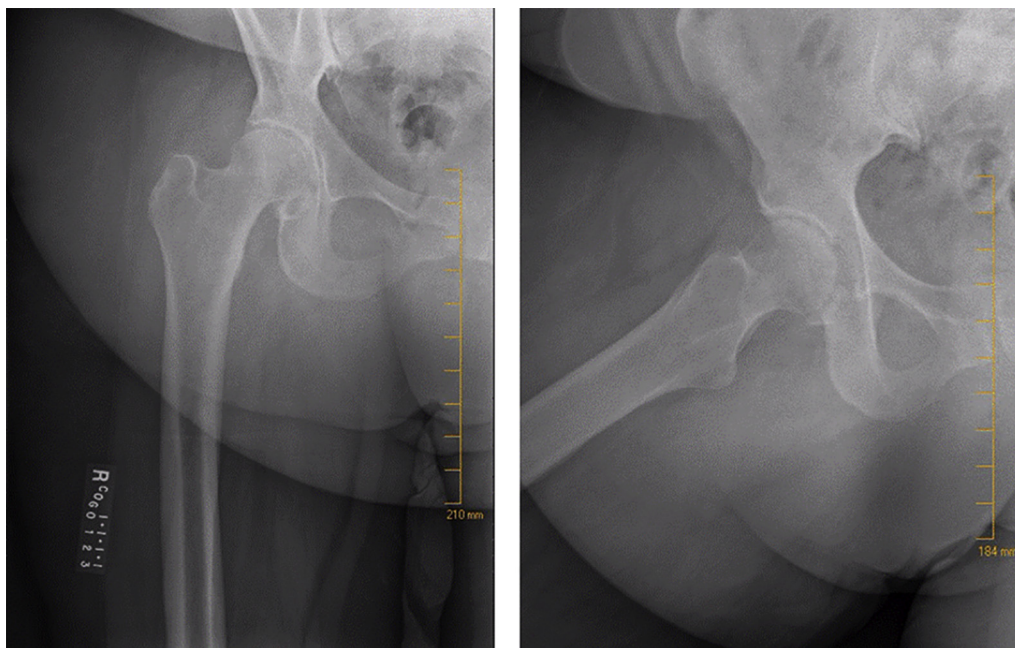
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**Figure 1.** Anteroposterior (AP) and frog lateral radiograph of the right hip before giving intra-articular injection showing minimal joint space narrowing suggestive of mild osteoarthritis.

smear, and culture test results were negative. A diagnosis of RDO of the hip was made, and 4 days later, an uncemented total hip arthroplasty (THA) was performed (Fig. 3). The femur head remnant that was removed during the procedure was sent for histopathological examination, which revealed degenerative joint disease. At 6-month postoperative follow up, patient was pain free and there were no signs of infection or loosening of the components.

A written informed consent was obtained from the patient regarding treatment, investigations, and photographic documentation. The patient was also informed that the data would be submitted for publication.

## Discussion

RDO of the hip is a rare disorder characterized by rapid joint degeneration and destruction. It is also known as rapidly progressive

osteoarthritis, rapid destructive hip disease, Postel's disease, rapidly destructive arthropathy, or atrophic osteoarthritis [4]. The joint destruction is typically unilateral, involving rapid destruction of both the acetabulum and femur head [4]. It usually occurs within 6 to 12 months of onset of symptoms, but in our case, the progression was very rapid.

The disease is usually seen in elderly women in the seventh decade of life and is unilateral in 80% to 90% of cases presenting as hip pain [5,6]. Within months, there is rapid and progressive chondrolysis detected by joint space narrowing on serial radiographs (>2 mm in 1 year or 50% joint space narrowing in 1 year) leading to severe osteoarthritis [7].

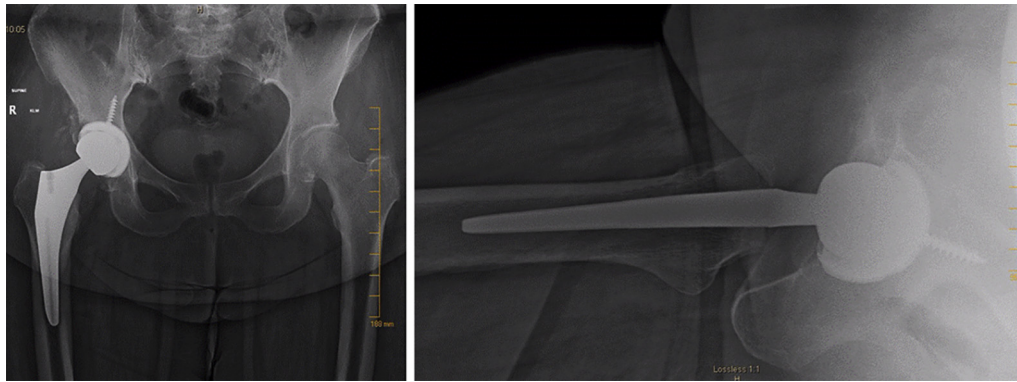
While the etiology is still undetermined, various associative factors have been postulated. Postel and Kerboull reported about direct drug toxicity and Yoshino et al. reported the association with long-term use of steroids (dose >10,000 mg) [8,9]. Mitrovic and Riera [10] reported that subchondral osteonecrosis and ischemia play important roles in its onset. Komiya et al. [11] performed molecular and biological research and found elevated levels of prostaglandins, interleukin-1 B, and metalloproteinase-2 and metalloproteinase-3 in the synovial fluid of patients with rapidly destructive hip arthropathy.

RDO appears to involve the interaction of 3 factors: mechanical stress, cartilage degeneration, and bone response in the genesis of the disease as suggested by Solomon et al. [12]. Rapidly destructive hip disease results when there is rapid cartilage degeneration, and the bone response is poor with no osteophyte formation resulting in atrophic or destructive osteoarthritis. Recently, subchondral bone ischemia and cell necrosis have been described as important factors in the pathogenesis. Several authors have demonstrated that local anesthetics (lidocaine, bupivacaine, and ropivacaine) are toxic to chondrocytes [13,14]. This issue has been raised recently in the radiology literature by Kamath et al. [15]. Severe chondrolysis has been reported in patients who had undergone continuous intra-articular infusion of bupivacaine at arthroscopy [16].

Multiple conditions can mimic rapid destructive hip disease, including infection, malignancy, neuropathic arthropathy, inflammatory arthritis, osteonecrosis, hemophilia, and onychosis [6,17].



**Figure 2.** AP radiograph of the pelvis with both hips, 2 months after the intra-articular injection showing the complete destruction of right femur head and the acetabulum with proximal migration of trochanter with minimal osteophytes on lateral side of the joint.



**Figure 3.** AP and cross-table lateral radiograph of same patient showing the well-fitted uncemented total hip prosthesis after the surgery.

When the joint destruction is so rapid as in our case, other possible causes must be ruled out. A complete preoperative workup of hip disease should be performed. Septic arthritis usually is associated with leukocytosis and local and systemic signs of infections. Patients with neuropathic arthritis do not present with pain and have a history of syphilis, diabetes mellitus, syringomyelia, or spinal cord injury. The patient in our report had excruciating pain with no neurological symptoms, thus excluding neuropathic arthritis. Inflammatory arthritis will present with multiple joint pain and morning stiffness and the characteristic serologic abnormalities. Anti-inflammatory drugs, especially indomethacin, may cause destruction by direct drug toxicity or by induction of an analgesic state (iatrogenic neuropathic joint) [18].

Long-term topical and systemic steroids have been speculated as a possible cause of avascular necrosis of the femoral head. However, it has not been described as rapid destruction in single-shot steroid administration. It appears very likely that, in this case, the intra-articular injection of steroid was the cause of chondrolysis and thus the rapid destruction of the joint. Furthermore, there is the risk of cartilage damage with intra-articular steroid injection that deserves further study.

## Summary

The treatment for this disease is THA. The joint reconstruction is, however, challenging because of intraoperative technical difficulties due to significant bone loss, increased blood loss and operative time, and the need for special implants [19]. Rapidly destructive arthropathy of the hip joint is known to have a good prognosis without major complications, such as infection. In our case, the patient had good prognosis with no complications after THA.

Rapidly destructive hip disease is a distinct entity, rapid in its progression, which requires extensive investigation and special efforts for its identification. Most of the patients require a THA with good final results as reported in the literature [6–8].

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