

Bilateral Osteonecrosis of the Femoral and Humeral Heads after Short Term Corticosteroid Therapy. A Case Study

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SUMMARY

Steroid induced osteonecrosis is a devastating injury that usually requires rebuild of the joint, with the femoral and the humeral head being most commonly affected. Steroid therapy is the most common reported cause of atraumatic osteonecrosis. The Collaborative Osteonecrosis Group Study confirmed that steroids are the primary cause of multi-focal osteonecrosis in 91% of the cases. Osteonecrosis is considered multifocal when three or more joints are involved.

We report a rare case of bilateral steroid-induced osteonecrosis of the proximal femora and humeri nine months after a short course of intravenous methylprednisolone for treatment of multiple myeloma.

The relationship between development of osteonecrosis and corticosteroid treatment has been extensively investigated. Steroid therapy is the most common reported cause of atraumatic osteonecrosis. Multi-focal osteonecrosis should be highly suspected and thoroughly investigated in patients with persistent pain at typical sites after commencement of steroids.

Key words: avascular necrosis, steroid therapy, femoral head, humeral head

BACKGROUND

Steroid induced osteonecrosis is a devastating injury that usually requires rebuild of the joint, with the femoral and the humeral head being most commonly affected. Osteonecrosis is considered multifocal when three or more joints are involved. The incidence of multifocal osteonecrosis is estimated to be around 3% [1,2]. In the majority of the cases osteonecrosis is asymptomatic and occurs early in the course of the disease [3]. Causation of atraumatic osteonecrosis is believed to be multifactorial and, in some cases, associated with both a genetic predisposition and exposure to certain risk factors. The risk factors commonly associated with multifocal osteonecrosis are, HIV infection, malignancy, systemic lupus erythematosus, renal disorders, Caisson disease, inflammatory bowel disorder and coagulopathies [4,

5]. We report a rare case of bilateral steroid-induced osteonecrosis of the proximal femora & humeri after a short course of methylprednisolone for treatment of multiple myeloma. The patient provided written informed consent for print and electronic publication of this case report.

CASE REPORT

A 58-year-old male presented to the outpatient clinic with bilateral groin pain and limitation of movement of both hips. Nine months earlier, this patient received 3 courses of 50 milligrams intravenous methylprednisolone for three days each after being diagnosed with multiple myeloma. The patient was suspected of having osteonecrosis of both hips, for which magnetic resonance imaging (MRI) was advised. MRI confirmed the diagnosis of bilateral femoral

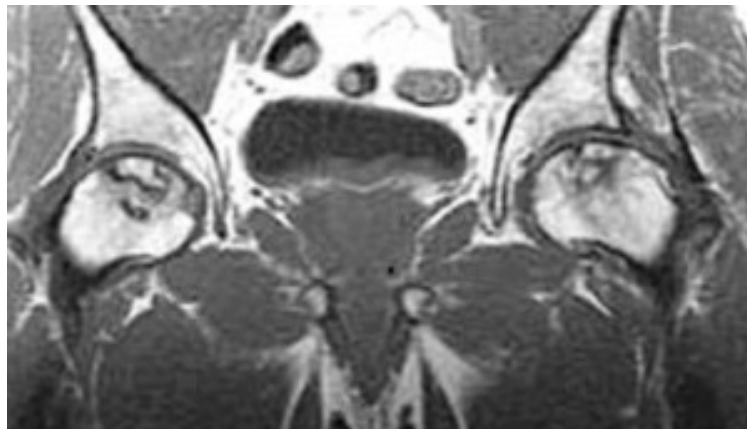


Fig. 1. The MRI of the hip joint. Bilateral femoral head osteonecrosis , more extensive in the right hip

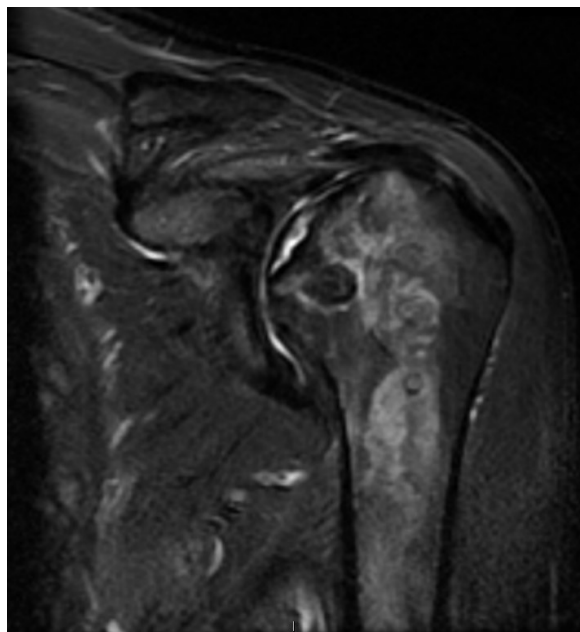


Fig. 2. The MRI of the left humeral head. Osteonecrosis of the humeral head with fragmentation and involvement of almost all the entire superior medial portion

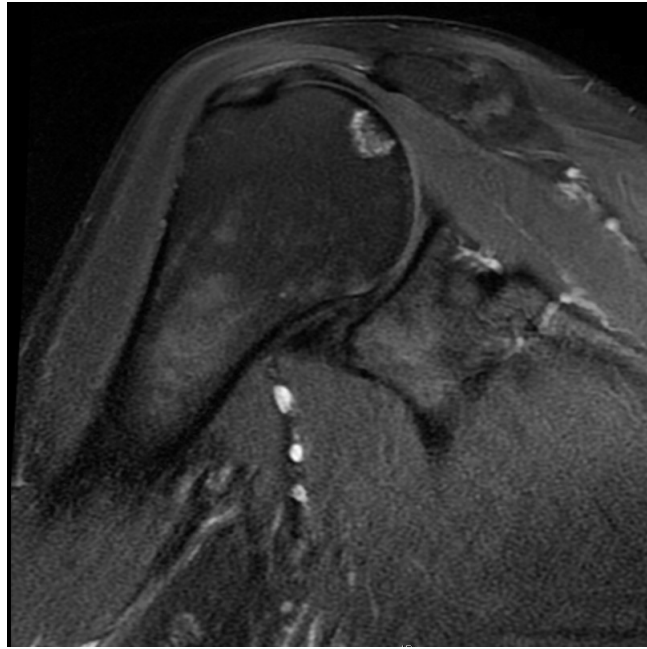


Fig. 3. The MRI of the right humeral head . There were two foci with low T1 signal affecting the central superior portions of the head, the larger one measuring approximately 10 mm in diameter

head osteonecrosis which was more extensive in the right hip (Fig. 1). He had bilateral total hip replacement as a staged procedure.

At one-year follow up he complained of bilateral shoulder pain that was worse on the left. A plain radiograph showed the crescent sign in the left humeral head. Given the previous history of the patient, MRI of the shoulder was requested. The MRI confirmed bilateral osteonecrosis of the humeral heads with fragmentation and involvement of almost all the entire superior medial portion of the left humeral head (Fig. 2). On the right side there were two foci with low T1 signal affecting the central superior portions of the head, the larger one measuring approximately 10 mm in diameter (Fig. 3). The radiological findings were discussed with the local tumour unit to confirm that the lesions were an extension of the osteonecrosis rather than myeloma deposits. A left shoulder hemiarthroplasty was done and the right shoulder is under surveillance. Sections from the both femoral and left humeral heads sent to histopathology confirmed the diagnosis of osteonecrosis. The patient is satisfied with the bilateral hip replacements and left shoulder hemiarthroplasty.

DISCUSSION

The relationship between development of osteonecrosis and corticosteroid treatment has been extensively investigated. Steroid therapy is the most com-

mon reported cause of atraumatic osteonecrosis [6]. Sakaguchi et al, found that patients who receive glucocorticoids are at approximately 20-fold greater risk to develop osteonecrosis in comparison with non-users [6].

The Osteonecrosis Group Study confirmed that steroids are the primary cause of multi-focal osteonecrosis in 91% of the cases [7, 8]. As regards multiple myeloma, the incidence of osteonecrosis is 9%. The hip is commonest joint to get affected and bilateral effects in the femoral heads are reported to be around 98% [9]. Previous sporadic case reports have described patients in whom multifocal osteonecrosis developed following a brief course of steroid therapy [9]. Cruess et al. reported that the interval between steroid administration and the onset of shoulder symptoms varies from 6 to 18 months [10]. This is comparable to the interval leading up to the onset of hip symptoms, which ranges from 6 months to 3 years or longer [8]. Bilateral osteonecrosis of both the femoral and humeral heads has only been reported in the literature by Taylor two years after steroid therapy [11]. Judicious use of glucocorticoids, such as the use of lowest effective doses, avoiding prolonged courses and minimizing the use of methylprednisolone may help to decrease the risk of osteonecrosis [2]. Maintaining a high index of suspicion helps the diagnosis of osteonecrosis post steroid therapy at an early stage where the clinical findings are scarce.

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