

# Management of Osteonecrosis of the Hip Complicated with Fracture: A Case Report

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## ABSTRACT

A 47-year-old gentleman, with underlying seborrhoeic dermatitis that was treated with steroid therapy, and hepatitis B, presented with pain in his right hip. He was diagnosed with stage 2 osteonecrosis of the right hip (Ficat and Arlet classification). Core decompression and bone grafting was performed but recovery was complicated by a surgical site infection. Wound debridement, removal of bone graft and clearance of the bone tunnel were carried out. The patient was allowed to bear weight after surgery. Twelve days later, he developed right hip pain and radiographs showed fractured femur neck; the patient then underwent a two-stage total hip replacement (THR).

### Key Words:

*Osteonecrosis, avascular necrosis, hip, core decompression, total hip replacement*

## INTRODUCTION

Osteonecrosis of the hip is a relatively common condition, predominantly found in males in their third or fourth decade of life. In early stages, the disease may be clinically silent, or patients may present with groin pain that is exacerbated by activity. Early diagnosis and treatment lead to better prognosis. Core decompression and bone grafting are sometimes complicated by deep infection or fracture. Joint replacement may have to be considered when the femur head cannot be salvaged.

## CASE REPORT

We report the case of a 47-year-old gentleman who presented with pain in his right hip. He had underlying seborrhoeic dermatitis, for which he had received corticosteroid therapy in the form of high dose intralesional injections every four months for the past 2 years, and concomitantly had a diagnosis of hepatitis B. He consumed alcoholic drinks occasionally, and previously smoked 20 cigarettes per day but this was reduced to 6-7 cigarettes per day since the development of the hip pain.

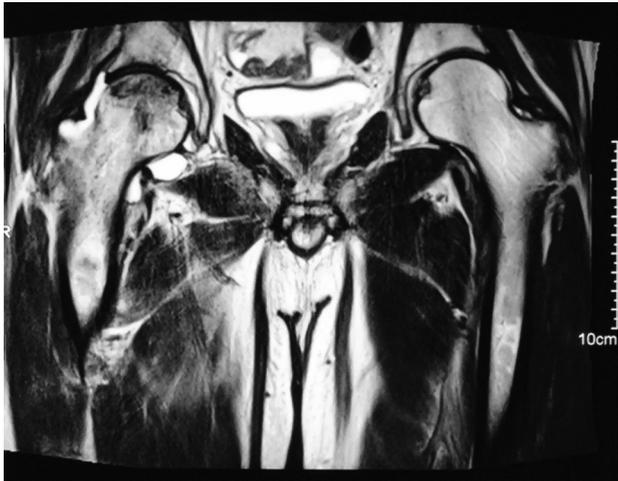
He was later diagnosed with Stage 2 osteonecrosis of the right hip (Ficat and Arlet classification), based on symptoms, plain hip radiographs and magnetic resonance imaging (MRI) findings (Figure 1a). He underwent core decompression and non-vascularised bone grafting of the right femoral head (Figure 1b). Recovery was complicated by a surgical site infection that developed 8 weeks post-operatively.

Wound debridement, removal of the bone graft and clearance of the bone tunnel were carried out about 12 weeks after the core decompression procedure. Cultures grew methicillin-sensitive *Staphylococcus aureus*, and appropriate intravenous antibiotic therapy (cloxacillin) was initiated. The patient ambulated with a walking stick after surgery. However, on Day 12 post operatively, his pain worsened. Plain radiographs showed a fractured neck of the right femur (Figure 2). Laboratory results showed an elevated white cell count, an increased erythrocyte sedimentation rate (ESR) of 89 mm/hour and a high C-reactive protein (CRP) level of 132 mg/L.

A two-stage total hip arthroplasty was then planned. In the first stage, wound debridement, PROSTALAC (Prosthesis of Antibiotic Loaded Acrylic Cement) implant and "home-made" antibiotic-loaded cement beads containing vancomycin, cefoperazone and gentamicin, were inserted into the bone cavity and the space surrounding the right hip. Specimens taken from the synovial fluid, soft tissue and the head of the right femur did not grow any microorganisms. Empirical antibiotic therapy was prescribed, and second stage surgery was performed 10 weeks later. No organisms resulted from cultures taken during the second stage surgery. Postoperatively, the patient was able to ambulate with the aid of a walking frame.

## DISCUSSION

Early diagnosis of osteonecrosis of the hip requires a high index of suspicion. The patient history is important, especially complaints of pain in the groin; associated risk factors such corticosteroid and alcohol use are also important as seen in the present case. Physical findings may be



**Fig. 1a:** Magnetic Resonance Imaging (MRI) showing osteonecrosis of the right femoral head.



**Fig. 2:** Plain radiograph of the pelvis showing a fractured neck of the right femur.



**Fig. 1b:** Plain radiograph of the right hip, post core decompression.

unremarkable or non-specific. Plain radiography is an important first line investigation. Bone scans have limited value and can be misleading due to false-negative rates in 25% to 45% of such cases<sup>1</sup>. MRI is the gold standard for diagnosing osteonecrosis (99% sensitivity and specificity) and has largely superseded bone scans<sup>1</sup>.

Treatment of osteonecrosis of the hip can be either medical or surgical, particularly during early stages. Surgical treatment can be divided into head-preserving procedures and THR. Patients at pre-collapse stages (Ficat and Arlet Stages 1 to 3) are treated with head-preserving procedures, the most popular being core decompression. After the femoral head had collapsed (Ficat and Arlet Stage 4) and arthritis sets in, THR may be the treatment of choice.

Core decompression and non-vascularised bone grafting were selected for this patient as his disease was classified as Ficat and Arlet Stage 2. The addition of vascularised or non-

vascularised bone grafting may enhance healing potential of the femoral head, prevent fracture through the proximal part of the femur and maintain the anatomy of the femoral neck if a THR is necessary<sup>1</sup>.

Lavernia and Sierra reported a surgical failure rate of 17% for Ficat and Arlet Stage 2 hips, progressing to THR, in their series of 67 core decompression procedures<sup>2</sup>. They noted that the most common complication of core decompression is subtrochanteric or intertrochanteric fracture<sup>2</sup>. Camp and Colwell reported that one patient in eight had a major fracture (mostly subtrochanteric) intraoperatively or within 6 weeks of surgical intervention in their series of 40 core decompression procedures<sup>3</sup>. Smith *et al.* believed that stress fractures at the site of entry of the core track could be avoided if the point of entry is proximal to the level of the lesser trochanter<sup>4</sup>. For the patient described here, the entry point might have been too low. We suggest a higher entry point to reduce the risk of stress fractures.

In cases of infection and after removal of the bone graft and debridement, the proximal part of the femur becomes weak and vascularity is affected. This results in a proximal part of the femur that is more vulnerable to fracture and further collapse of the femoral head. In such cases, it is prudent to delay weight-bearing and carefully monitor the patient's

progress, both clinically and radiographically. Some surgeons do not allow weight-bearing for 6 weeks post core decompression<sup>3,5</sup> while others allow partial weight-bearing with the use of both crutches for 6 to 8 weeks<sup>4</sup>. We suggest a non-weight bearing period of 6 to 8 weeks followed by a period of partial weight-bearing for another 6 to 8 weeks.

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