Avascular necrosis of the hip treated with Metal-on-Metal surface hip arthroplasty

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Abstract
We describe a 21 year old patient with avascular necrosis of the hip joint due to T-Cell Acute Lymphoblastic Leukemia treated with Metal-on-Metal surface hip arthroplasty with an excellent outcome at 5 year follow-up.

Introduction
Avascular necrosis of bone is a well-known but rare complication of combination chemotherapy and high dose corticosteroid therapy for leukemia with a reported incidence
ranging from 1 to 15 per cent [1,4].

We describe a 21 year old case with avascular necrosis of the hip joint due to T-Cell Acute Lymphoblastic Leukemia treated with Metal-on-Metal surface hip arthroplasty with an excellent outcome at 5 year follow-up.

Case Report

A 21 year old man presented with painful right hip for a period of four years. The past medical history was significant for T-Cell Acute Lymphoblastic Leukemia, which was treated with high dose corticosteroids and combination chemotherapy. He was diagnosed with avascular necrosis of the right hip (Figure 1) and was offered hip replacement.

Figure 1. Preoperative anteroposterior radiograph revealing advanced avascular necrosis of the right hip.
He underwent a Metal-on-Metal surface hip replacement. The uncemented dual coated 54mm cup and cemented 48mm femoral head (Cormet 2000, Corin Medical) were implanted (Figure 2). At 5 year follow up from the surface hip replacement, the patient has an excellent result (Harris hip score-94.4). His haematological indices for leukemia remain normal and he remains in remission.

Figure 2. Immediate postoperative radiograph showing Metal-on-Metal hip resurfacing arthroplasty.
Discussion

The current trend is moving from a conventional primary total hip arthroplasty to a conservative Metal-on-Metal surface hip arthroplasty for the treatment of younger patients with advanced hip disease [3,5]. Recently, there has been a remarkable improvement in the prosthetic design of Metal-on-Metal resurfacing prostheses. Improved sphericity, use of large sized (50 mm) head, thick film lubrication (100 micrometre) and high carbide content have been shown to improve wear characteristics significantly [2,6]. The new version of Metal-on-Metal surface hip is made of Cobalt Chrome Molybdenum (CoCrMo) alloy. No evidence is available yet on the effect of disseminated metal ions on the body. In in-vivo studies, cobalt ions were found to be disappeared from the operation site, while chromium persisted. It has been observed in in-vitro studies that cobalt based alloy particles inhibit bone growth, being toxic to the osteoblast like cell lines and inhibit production of type I collagen, osteocalcin and alkaline phosphatase [2]. The carcinogenic effect of the metal ions is unclear and causation of leukemia or leukemik relapse is not proven in vivo yet. This case illustrates the role of Metal-on-metal hip resurfacing arthroplasty as a potentially viable option for younger patients with aseptic osteonecrosis secondary to the chemotherapeutic management of acute lymphoblastic leukemia.
References


