

Severe metallosis following oxidised zirconium wear in total hip arthroplasty

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DESCRIPTION

We present a case of a man aged 81 years who underwent a primary cementless total hip arthroplasty. Eight years after the index surgery, failure of the arthroplasty was revealed by the presence of the radiographic 'cloud sign' (figure 1). The original components used were the R3 acetabular cup with a Synergy femoral stem, highly crossed linked polyethylene liner and an oxidised zirconium (Oxinium) femoral head (Smith & Nephew Synergy, Memphis, Tennessee, USA). The initial investigation included a CT scan, full blood tests and a tissue biopsy which revealed no malignancy. Subsequently, during revision surgery, there was extensive osteolysis with metallosis. There was black staining of the periprosthetic soft tissues and the hip pseudocapsule was filled with thick black fluid (figure 2). There was severe wear of the femoral head and the polyethylene liner. Following debridement and removal of the components, a revision cementless stem and acetabular cup was used to reconstruct the hip joint.

The cloud sign in the plain radiographs—also known as the bubble sign—is an indication of soft tissue metallosis.¹ The findings are usually subtle



Figure 1 Anteroposterior plain radiograph, without use of contrast medium, showing an extensive cloud sign of the periprosthetic tissues, failure of the acetabular cup and wear of the oxinium femoral head.



Figure 2 Intraoperative photograph during revision surgery. There is black staining of the periprosthetic tissues and osteolysis around the peritrochanteric area.

and the debris is well tolerated by the patients. A few cases with characteristic radiographic findings are reported in the literature, but to the best of our knowledge, the present case is the most impressive due to the extent of the metallosis.^{2 3} Oxidised zirconium is a metallic alloy with a ceramic surface that combines the best of metal and ceramics. However, if the outer surface of the head is damaged, then rapid destruction of the head can occur.

Learning points

- ▶ The cloud sign in a plain hip and knee radiograph is an indication of soft tissue metallosis.
- ▶ When the surface of an oxidised zirconium femoral head is damaged, rapid wear of the metallic alloy of the core can occur.
- ▶ The metallic debris is well tolerated by the patient. Patients with an oxidised zirconium hip or knee replacement need regular follow-up.

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