CASE REPORT

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Ceramic femoral head fractures in total hip replacement

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Abstract Two cases of fracture of the ceramic head of a total hip replacement are presented. In both cases the damaged components were replaced with satisfactory results.

Résumé Les auteurs rapportent deux cas de rupture de la tête céramique après arthroplastie totale de l'hanche. Nous avons traité les deux cas par remplacement de la tête cassée par une autre des mêmes caractères. Le résultat après le traitement a été bon.

Introduction

Fracture of the ceramic femoral head is considered a rare complication in total hip replacement (THA) [1–3, 5, 7–9, 12, 15–17, 20]. Pulliam and Trousdale [18] state that according to information supplied by the manufacturer, their case represented only the second fracture of more than 7 500 ceramic heads, which had been implanted with cement. Artine-Díaz et al. [2] observed only one fracture in 2 200 THAs performed in their department between 1965 and 1994.

Case reports

Case 1

Three years after a primarily successful uncemented THA with a CLS-stem and a 28-mm ceramic femoral head, a 48-year-old woman had a sudden onset of pain in the hip. No trauma had been encountered. A radiographic examination of the hip revealed a breakage of the ceramic femoral head (Fig. 1). A revision was performed and the ceramic head was removed (Fig. 2), and a new ceramic femoral head was inserted onto the original femoral stem, conserving the acetabular component, which was undamaged. Eight years after the revision, the patient had no pain and had resumed normal activity. A radiographic examination at the last follow-up demonstrated a correct position of the prosthesis components.

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Case 2

Three years after a primarily successful uncemented THA using CLS-stem and 28-mm ceramic femoral head, a 47-year-old male had a sudden onset of a severe ache in the hip, there was no history of trauma. Radiographically a breakage of the ceramic femoral head was demonstrated (Fig. 3). A revision was carried out and the femoral stem and the acetabular component were found to be undamaged and well fixed and were preserved. A ceramic femoral head was inserted onto the original femoral stem. Six years after the revision, the patient had no pain and his activity was almost normal. The radiographic study at the last follow-up showed a correct position of the prosthesis.

Discussion

Several factors may increase the risk of fracture of the ceramic femoral head [2, 17]. Trauma, directly or indirectly, high levels of activity and overweight may increase the risk of breakage by increasing the load across the joint surfaces [2, 6, 7, 11, 15, 17, 18]. However, Nizard et al. [13] found that the ceramic heads in the patients who were less than 50 years old, and therefore presumably more active, had a better rate of survival than those in older patients [13].

Other factors to take into account are related to the defects of materials (ceramics of the head, metallic taper, polyethylene of the acetabular component). Any fault in the manufacture of the ceramics or any of the prosthetic components that are in contact with the head might provoke a progressive deterioration or rupture of the femoral head [2, 4, 11, 17].

The most important factors are those of the surgical technique and errors in implantation of the prosthesis [2, 11, 17, 18]. It is a fact that ceramic heads of 28 mm in diameter are more prone to rupture than larger heads [4, 11, 19].

It was usual that no trauma had taken place previous to the rupture [1, 4, 8, 11, 14, 16, 18], as occurred in our two cases. Fracture of the ceramic head is as likely to occur as in cemented [17] as in non-cemented THAs [1, 2, 14–16]. While some authors state that the ruptures usual-

Fig. 1 Anteroposterior radiograph of the right hip of case number 1 with fracture of the ceramic femoral head

Fig. 2 The broken ceramic femoral head from case number 1

Fig. 3 Anteroposterior radiograph of the left hip of case number 2 demonstrating a fracture of the ceramic femoral head

ly appear during the first months after the operation [1, 4, 9, 18], others have observed that it is more frequent after the first year [2, 8, 10, 14, 15, 17]. In our two cases, the fracture occurred after 3 years.

At the revision, the fractured ceramic head is substituted, leaving the unaffected components in situ [2, 4, 5, 12, 15–17, 20] as was also done in our patients.

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