CASE REPORT

Revision of a cementless well fixed short stem, integrated with femoral perforation.


Abstract

A 62 year-old man underwent a right total hip replacement on 2012. A femoral perforation was performed during the procedure, undetected, and a short stem was implanted with the tip of the implant protruding outside the posterior cortical femoral bone. One year after the procedure, he consulted to our unit, presenting a painful total hip arthroplasty, with a TaperLoc Microplasty stem perforating the posterior femoral cortex, protruding over 1 cm. The stem was revised and a transfemoral osteotomy was required to exchange it. As a complication, presented non-union that eventually became well-tolerated by the patient. One year and three months after the revision surgery, the patient presents a moderate result, referring pain occasionally and walking without aids.

Keywords

Revision surgery, well fixed implant, short stem, total hip arthroplasty, complication.

Introduction

Intraoperative femoral cortex perforation is a rare complication, reported in 0.07% of primary hip arthroplasties. When undetected, the stem fits inside the adapted femoral canal and around the cortical borders of the hole, and the distal tip protrudes outside the bone. We describe the first case reporting the revision of a TaperLoc Microplasty femoral component in such malposition, requiring a revision surgery.

Case Report

A 62 year-old man underwent a right total hip replacement on 2012, by an anterior approach, in another hospital. It was indicated to treat a displaced femoral neck fracture. He consulted at our center one year after, due to the presence of hip pain, located posterior and lateral. On physical examination, no mass was palpable and the passive mobilization provoked moderate pain. No neurological...
Impairment was observed. His body mass index was 25.83 kg/m². The right leg was slightly shorter than the left evaluating the distance from the anterosuperior iliac spine to the medial malleolus. The plain radiology study showed an abnormal narrowing at the tip of a short stem, that was explained by the presence of a posterior cortex perforation of the femur (Fig 1). Moreover, the bearing surface was metal-on-metal, with a big diameter head. The blood tests were negative for infection or for problems with the bearing surface, with a C-reactive value of 0.03 (normal value <1), ESR 5mm/h (1-20), serum Cobalt level of 1.5 micrograms/L (normal value <5.0) and serum Chromium level of 3.3 micrograms/L (normal value <2). The patient underwent an scintigraphic study due to the presence of radiolucencies at the proximal femur: the results did not suggest loosening.

The implant was completely exchanged. The surgery was performed using the Hardinge modified approach. The cup was removed using the Explant System. The stem was difficult to remove. Initially it was attempted with flexible chisels (Renovation System, Smith&Nephew), a high speed drill of small diameter (CORE, Stryker), a longitudinal osteotomy, and finally was completed with a Wagner transfemoral osteotomy. After removing the stem, a cortical mold of the stem was remaining inside the metaphyseal area, and it had to be removed with the use of a high speed drill. The new implant was a G7 cup and a Arcos modular revision stem, using as a new bearing the pair of a 36mm a cobalt-chrome head against a Vitamin E stabilized highly crosslinked polyethylene, without elevated rim (Biomet). Intraoperative radiology was used to confirm the correct dimensioning and positioning of the new implants. The osteotomy was stabilized with a 1.6mm Dall-Miles cable (Stryker). Intraoperative cultures were negative for infection.
After the surgery, the patient was maintained resting in bed for 5 days. The postoperative radiology showed a moderate mobilization of the greater trochanter fragment and the patient was allowed to sit and to walk without weight bearing during 3 weeks using two forearm crutches. After those 3 weeks, he was allowed to initiate progressive partial weight bearing, and at 3 months total weight bearing. The patient presented lateral pain and the transfemoral osteotomy did not heal on radiology. He was proposed for reduction, grafting and plate fixation, but after 6 months, the pain progressively improved over time, and he opted to avoid further surgical procedures. At the latest follow-up at one year and three months the radiology shows a greater trochanter nonunion, but the patient is in pain just occasionally, he walks without aids and the hip has a normal range of motion. He has been programmed for subsequent clinical and radiological revisions.

Discussion

Femoral cortex perforation during the preparation for the implantation of a total hip arthroplasty has been described to occur mostly at lateral, anterior and posterior femoral cortex. Several causes have been argued to explain femoral perforation, such as obesity or abnormal femoral anatomy. The patient in this case was not obese, nor did have an abnormal femoral anatomy. We consider that the surgical approach could have been the cause. The direct anterior approach provides excellent visualization of the acetabulum, but the exposure to the femur is difficult [1]. Femoral perforation has been reported to occur as an specific complication during the learning curve of this approach; some authors do not present this complication [2], but others report it to occur between 0.3% to 0.38% out of the first cases [3,4].

We consider that in order to minimize the risk of this complication and its further consequences, it is paramount to perform intraoperative radiology, to confirm correct dimensioning and positioning of the stem, both with anterior an axial views of the femur. For some cases detected late after the surgery, the evolution has been described surprisingly satisfactory, without the need of surgical revision [5,6,7]. If it occurs in this way, it seems reasonable to wait for a few months in order to determine the tolerance of the patient to this situation. However, if detected before the integration of the implant, we would propose an immediate surgical revision of the stem. In the present case, the bearing was also a cause of concern, due to the risk of high blood levels of cobalt and the cup, liner and head were also exchanged.

References


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Conflicts of interest statement

The authors declare no conflict of interest related to the publication of this manuscript.

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