



Primary total hip arthroplasty with a retained intramedullary femoral nail

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Retained intramedullary femoral nails can pose a problem for the implantation of the femoral component during total hip arthroplasty (THA) and they must often be removed. A patient with a retained Küntscher femoral nail implanted 47 years previously presented in our outpatient clinic for a THA. Since removal of the nail was impossible without severe damage to the femur, we chose to perform an extended trochanteric osteotomy, to cut the proximal part of the nail and to implant a cemented short stem with its tip in the hollow end of the nail.

Keywords : total hip arthroplasty ; retained intramedullary nail.

CASE REPORT

A 60-year old man presented with severe complaints from an arthritic left hip. At the age of 13 he had undergone an intramedullary fixation with a V-shaped stainless steel nail of the femoral shaft and screw fixation of the femoral neck after a left femoral neck and shaft fracture. The screws in the femoral neck were removed several months later. One year before the current consultation, he successfully received a total hip arthroplasty (THA) for his arthritic right hip. Radiographs of the left hip showed a severely deformed femoral head with secondary osteoarthritis of the hip joint. The intramedullary nail was seen *in situ* in the femoral canal, starting from the tip of the trochanter (Fig. 1). All possible

non-operative treatments were unlikely to relieve the complaints. Owing to the deformity of the femoral head and neck, it was deemed impossible to perform a resurfacing arthroplasty or to implant a very short stemmed anatomic femoral component. We decided first to remove the nail and to perform a THA in a second stage. Unfortunately, during the operation we found out it was impossible to remove the buried nail without damaging the femur. To implant a THA we performed the operation as described in "Surgical Procedure". Postoperatively, hip exercises were performed and toe-touch non-weight-bearing ambulation was permitted. Fifty percent weight bearing was allowed after 6 weeks, and full weight bearing after 3 months. The Harris Hip score improved from 34 preoperatively to 92 at four months, with no complaints of pain or functional impairment. The radiographs directly post-operative as well as the latest radiograph at four months (Fig. 2) showed a good positioning of the THA and a good fixation of the extended trochanterotomy.

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Fig. 1. — On the left, a femoral intramedullary nail starts from the tip of the trochanter. On the right a successfully implanted THA.



Fig. 2. — At the latest follow-up of four months the radiograph shows a good position of the THA and a fixed trochanter osteotomy.

Surgical Procedure

The hip was approached through a distally extended posterolateral approach. After removal of the femoral head, an extended osteotomy of the greater trochanter was performed, and a high-speed diamond burr was used to separate the proximal part of the nail. In order to avoid creating a stress riser between the tip of the stem and the nail, we decided to remove the proximal nine centimetres of the nail, so as to make it possible to fit the tip of a small revision stem, designed for cement-in-cement revision procedures (Short Revision Stem, Stryker, Mahwah, NJ, USA) two centimetres in the hollow proximal end of the nail. With a drill, the ingrown bone in the hollow centre of the nail was removed, just enough to achieve a sufficient fitting of the trial stem (Fig. 3). After fixation of the trochanter with cerclage wires a cemented dual mobility acetabular cup (Avantage, Biomet, Warsaw, USA) was implanted. Since the patient presented with a substantial atrophy of the limb, we implanted this acetabular component in order to reduce the risk of dislocation of the THA. The proximal femoral canal was then reamed and the stem was cemented. To achieve maximal stability, we increased the leg length by three centimetres.

DISCUSSION

Total hip replacement can be challenging in case of a previously operated proximal femur with retained intramedullary hardware (2,3). Mont *et al* proposed a metal-on metal hip resurfacing arthroplasty when confronted to extra-articular deformities or implants making implantation of a stemmed hip prosthesis impossible (3). Duffy *et al* described a case of a patient with a retained cannulated reamer from a previous revision knee arthroplasty. They performed a total hip replacement using a stemless anatomic femoral component (2). A variety of techniques have been described for removal of broken or buried intramedullary nails, in order to achieve minimal damage to the bone (1,5). Richards *et al* describe a method using a cement-loaded hollow Küntscher nail with a femoral stem implanted in the proximal end of the nail in revision arthroplasty in infected total hip arthroplasty (4). Satisfactory results were achieved in four patients with an infected THA and massive femoral bone loss. Wroblewski *et al* described eight consecutive patients treated with a conventional Charnley stem slotted down on a



Fig. 3. — A sufficient fitting of the trial stem was achieved with the tip in the hollow end of the nail.

Kuntscher nail after a subprosthetic femoral shaft fracture. This method proved to be successful after a follow-up of 16 to 70 months (6). Our patient presented with a buried femoral nail, which was in a first attempt impossible to extract. Since the placement of a resurfacing or very short stemmed total hip prostheses was not possible, we had to find a strategy in order to implant a conventional stemmed THA. The use of a small revision stem, implanted

with the tip in the proximal hollow end of the retained nail proved to be a successful solution of our problem.

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