



## Head-neck disassembly of an uncemented revision stem treated by addition of a proximal spacer

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**A 67-year-old woman underwent revision total hip replacement with a long, distally fixed uncemented stem inserted through a transfemoral approach. Initial stability was not achieved and the stem subsided early. Probably due to a conflict with the minor trochanter, the prosthetic head detached from its neck. Instead of a re-revision of the stem, a proximal spacer was inserted to restore stability and to compensate for leg-length discrepancy. This has proved to be a stable and satisfactory solution after three years follow-up.**

### INTRODUCTION

Modularity in total hip replacement has undoubtedly facilitated primary and revision total hip replacement (THR) (2, 5). The versatility of modular prostheses is however burdened with the risk of generation of wear debris due to fretting corrosion and dissociation of the components (6, 10).

Disassembly of the polyethylene liner from the metal shell has been reported (3, 7). Disconnection between the head and neck of a femoral prosthesis is probably uncommon (8, 9, 12) and is usually a post-traumatic complication (1).

In the present case, head-neck disassembly occurred spontaneously following early subsidence of a femoral revision stem.

### CASE REPORT

A sixty-seven-year-old woman underwent revision of an uncemented threaded cup and a madreporic Lord-like stem implanted sixteen years

previously for osteoarthritis. Over the last two years the patient had developed increasing pain localised at the buttock and the thigh. Preoperative radiographs showed progressive central migration of the socket and slight protrusion. No signs of loosening of the femoral stem were evident (fig 1a). Revision surgery was performed in April 1999. Through a lateral approach in supine position the loosened cup was easily removed. A transfemoral approach according to Wagner (11) was needed to remove the long and extensively porous-coated stem that was well fixed to the femoral canal. Some fragmentation of the cortical bone could not be avoided. A homologous bone graft was used for the massive acetabular defect and the reconstruction was completed with a Burch-Schneider Anti-Protrusio Cage (Sulzer, Switzerland) and a Müller polyethylene cemented cup. The femoral revision was performed using a Profemur modular stem (Cremascoli Ortho S.p.A., Italy). The Profemur stem is a cementless titanium alloy prosthesis consisting of three parts: diaphysis,

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**Fig. 1.** — A) Preoperative radiograph : there is slight protrusion of the threaded cup. The uncemented stem appears to be extensively fixed to the femoral canal. B) The postoperative radiograph shows the acetabular reconstruction using a bone allograft and an anti-protrusion cage. A transfemoral approach was necessary to remove the previous stem : a modular Profemur prosthesis was implanted in order to provide distal fixation. C) The progressive subsidence of the femoral component led to a 30-mm shortening of the right limb after six months.

metaphysis and ball head. It has a rough surface with longitudinal antirotation wings. In the present case the longest (215 mm) diaphyseal component was used in order to provide a stable distal fixation. The stem was assembled using an extra-small proximal part and a 28-mm ceramic head for a total length of the implant of 295mm. The femoral osteotomy site was closed and fixed with a Dexon loop (fig 1b). Postoperatively a brace was applied and

weight bearing was not permitted. Despite these precautions, the first radiograph, performed thirty days after surgery, revealed a 10-mm subsidence of the femoral stem. Weight bearing was delayed for an additional three months, but a progressive subsidence was observed up to six months after surgery, when the stem probably achieved its definitive stability : the final shortening measured some 30 mm (fig 1c). Nevertheless, the patient had been able to



**Fig. 2.** — A) The subsidence of the femoral stem was complicated with head-neck disassembly probably because of impingement with the calcar. B) Insertion of a spacer between the components of the modular stem allowed reducing the prosthesis dislocation and partially restoring the leg shortening. C) The 3-year radiograph demonstrated no additional subsidence of the femoral component.

recover an effective range of motion and a satisfactory deambulation, and the functional recovery appeared to be fairly good at follow-up in January 2000. One week later, while performing a simple movement of flexion and slight adduction, the patient experienced a sudden click followed by complete functional disability and impossibility to bear weight. Standard radiographs showed dislocation of the femoral stem and neck while the head of the prosthesis remained inside the polyethylene cup : no additional subsidence could be observed (fig 2a).

A re-operation was subsequently performed in February 2000. Using the same lateral approach the

proximal part of the femur was exposed, and the ceramic ball head was found in the socket.

The reason for disassembly was found to be impingement of the base of the ball head against the lesser trochanter, acting as a levering system.

The modularity of the femoral revision stem allowed restoration of the joint stability and some compensation for subsidence by interposition of a 26-mm long spacer between the proximal and distal femoral components (fig 2b). This was performed after the proximal component had been removed and the stability had been tested and confirmed.

The postoperative recovery was uneventful and a quick functional recovery was achieved. Three years later the postoperative 5-mm shortening was unchanged and no further subsidence of the stem was measured (fig 2c).

## DISCUSSION

The availability of modular prostheses has certainly facilitated primary and revision THR, and orthopaedic surgeons can rely on multiple options in order to optimise hip biomechanics (2, 5).

However, the more modular these implants are, as seen in several contemporary uncemented revision stems, the higher is the risk for generation of metallic wear debris from interprosthetic junctions and also for disconnection of the links (6, 10).

Dissociation of the polyethylene liner and the metal shell of the acetabular cup has been reported (1, 3, 7) : due to improvement of the locking mechanism, this complication has become rare.

Modular femoral stems with two or more parts (stem and neck) may disassemble during closed reduction of a dislocated prosthesis, but rarely otherwise (8, 9, 12). Mechanical trauma can be responsible for a prosthesis disconnection (1).

Our case presents two essentially different peculiarities. Firstly the probable causal mechanism was a pronounced subsidence of the stem. This is a serious complication in distally anchored femoral prostheses, and in particular in association with an extensive metadiaphyseal osteotomy (4, 11). Probably, the disengagement of the head has also been induced by a failure of the conical taper lock of the prosthetic stem, as the ceramic head was fixed through a rotating movement and no hammering impaction.

The second peculiarity is how this complication was corrected during surgery. The simple addition of a modular shaft element to the stem made it possible to stabilise the diaphyseal component, so that the revision was limited to the replacement of the

metaphyseal part and the prosthetic head, the duration of surgery was shortened and rehabilitation was fastened.

Implantation of a 26-mm long spacer between the meta- and diaphyseal components has restored most of the limb shortening that resulted from the stem subsidence.

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