

# Dislocation of a polished femoral stem following a cemented total hip arthroplasty: A report of 2 cases

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## ABSTRACT

We report 2 cases of hip dislocation after a total hip arthroplasty, which could not be successfully reduced by closed method. Post-manipulation radiographs revealed proximal migration of the prosthesis in both cases, which required open reduction. The pathogenesis and treatment of this hip dislocation is discussed.

**Key words:** arthroplasty, replacement, hip; hip dislocation; prostheses and implants

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## INTRODUCTION

Despite many recent advances in total hip arthroplasty,

hip dislocation as a complication is still reported typically at a 1% to 5% rate of incidence. The causes of the dislocation such as malposition of components, poor soft-tissue tension, a wrong surgical approach, and bad prosthetic design have been well cited in the literature.<sup>1,2</sup> In most cases, closed reduction can be easily achieved under sedation or general anaesthesia.

Irreducible hip dislocation is very rare and is usually due to dissociation of a modular femoral or acetabular component, which prevents relocation.<sup>3</sup> Less likely causes of irreducible hip dislocation include false aneurysm,<sup>4</sup> entrapment of the iliopsoas tendon,<sup>5</sup> as well as interposition of gentamicin beads,<sup>6</sup> joint capsule,<sup>7</sup> and cement fragments.<sup>8</sup>

This report describes 2 unusual cases of irreducible dislocation following a total hip arthroplasty through a posterior approach. Both failures apparently were related to the operative technique and probably due to the design of the implant. Two such cases have been reported previously in the literature.<sup>9,10</sup>

## CASE REPORT

### Case 1

A 73-year-old woman presented to Health Care Hawkes Bay, Hastings in July 1998 with a painful hip caused by osteoarthritis. She had a history of hypertension and had undergone surgery for atherosclerosis of the carotid artery. An Exeter (Howmedica International Inc., Clare, Ireland) cemented hip arthroplasty was performed through a posterior approach. The postoperative period was uneventful and she was discharged home on day 6.

A month later, she slipped in the shower and posteriorly dislocated the prosthesis. The leg was shortened and internally rotated. An emergency registrar attempted to forcefully reduce the dislocation under midazolam and morphine, but the attempt was unsuccessful. Post-manipulation radiography showed a proximal dislodgement of the femoral prosthesis (Figure). The following day, an open reduction was performed through the previous surgical scar. The femoral component was reduced into the cement mantle and then the hip was reduced into the cup. A stable reduction was therefore obtained. At 12-month follow-up, the patient was able to walk without assistance. Radiographs showed no signs of loosening of the femoral component.

### Case 2

A 60-year-old woman, who had a history of degenerative arthritis of the hip, underwent a hybrid hip replacement using a cemented polished CPT femoral stem (Zimmer, Warsaw [IN], US) and an AML 100 series acetabular cup (DePuy Orthopaedics Inc., Warsaw [IN], US), through a posterior approach in March 1998 at Health Care Hawkes Bay. The postoperative period was complicated with recurrent dislocation. At the third dislocation, a closed reduction in the emergency department dislocated the femoral stem proximally by 4 cm. An open reduction was then performed, in which a smaller-sized stem was pushed back into the existing cement mantle with one lot of cement and the hip was reduced with a longer head (3+). The postoperative period was uneventful and at 12-month follow-up, the patient was able to walk with a stick. She died 18 months later due to non-Hodgkin's lymphoma.

## DISCUSSION

Fixation of hip prostheses by the use of



**Figure** Proximal dislocation of the polished stem at the cement-stem interface.

polymethylmethacrylate bone cement revolutionised hip prosthesis surgery 3 decades ago. Some advocate pre-coating or rough surfacing of the stem to achieve maximal bonding between the surface of the stem and the cement,<sup>11</sup> whereas others advocate a polished surface with minimal bonding.<sup>11,12</sup> In experiments, rough stems produced more cement damage than polished ones. According to the Swedish Hip Register, polished stems were clinically superior with respect to stems with a mat surface finish.<sup>13</sup>

A tapered polished femoral component made of stainless steel was developed in 1970 for use in primary total hip arthroplasty with cement—a polished stem allowing a small amount of subsidence and remodelling of cement.<sup>12</sup> The wedge-shaped design also allows the component to slide proximally if distracted, and this is theoretically possible when reduction of a dislocated prosthesis is performed.

Although polished stems have been widely used, there have been only 2 reports of stem displacement during closed reduction of the dislocation.<sup>9,10</sup> This can be avoided by cementing over the shoulder of the hip

prosthesis and by carefully reducing the dislocation under an image intensifier.

Compared to Charnley's stem, the shoulder of the Exeter or CPT prosthesis is wider and it can take more bone from the greater trochanter and align the prosthesis in neutral position to varus and valgus. Under such conditions, failure to cement the top of the shoulder may predispose the stem to dislodgement. In addition, the shoulder of the prosthesis should be well below the tip of the trochanter. Case 1 demonstrated that the shoulder of the prosthesis was at the level of the tip of the greater trochanter because we felt that this positioning on trial reduction was more stable. This positioning may predispose to proximal migration and should be avoided. If stability is the problem at the trial reduction with normal positioning of the stem, then a stem with higher offset (50 mm) or an extra or extra plus head should be used.

Surgeons should be aware of this problem when

performing closed reduction to a dislocated hip. This complication should be discussed with the patient while obtaining informed consent for closed reduction. Using excessive force to reduce the hip in the emergency department should be avoided. When resistance is felt, it is safer to perform hip reduction under fluoroscopy and general anaesthesia with a full muscle relaxation.

When closed reduction of a dislocated polished femoral stem failed, open reduction should be performed by pushing the stem back to the cement mantle or using a one size smaller prosthesis in the cement mantle with cement over the shoulder. If instability persists, an extra-length head should be used.

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