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Letter to the editor

Letter to the editor on “Asymptomatic intraprosthetic dual mobility cup dislocation with increased metal ion levels”

We had the opportunity to read the manuscript by Maarten Koper et al [1] and we did it with great interest, as the authors described a rare dual mobility cup (DMC) complication, that is intraprosthetic dislocation (IPD), associated with increased metal ion levels, which has not been described yet. In their discussion, they suggested regular clinical and radiological follow-up in all patients with a dual mobility cup to detect promptly the potential complications of this system. However, in our opinion, a poor analysis of the possible biomechanical and tribological risk factors of IPD and a wrong choice of the femoral stem are the main limitations of Koper's article.

Based on Philippot classification [2], they described a type 1 IPD which occurred 2 years after revision. Late IPD is mainly related to the wear of the retentive rim of the mobile polyethylene liner and the femoral head in the “third joint” [3-5]. Nevertheless, the authors either did not find any macroscopic damage of the polyethylene liner or study the retrieved liner to demonstrate the possible zone of wear that creates the dislocation of the femoral head. Considering tribological studies, it has been demonstrated [6,7] that IPD is due to retaining rim wear and not to a traumatic phenomenon with hip dislocation. IPD is a wear complication from mainly the outer side of the liner-retaining rim. This wear is mainly due to contact between the femoral neck and the outside of the rim. IPD appeared with the first DMC series because a large nonpolished neck was used. When the second-generation DMC was introduced, the rate of IPD has been reported to have an incidence of only 0.1% [8]. This reduction can be explained by the following factors: optimization of the contact between the prosthetic neck and retaining ring, optimization of the chamfer, use of higher molecular weight polyethylene, and change to a polished neck that is trapezoid, elliptical, or circular in shape. This decrease in the incidence of IPD is confirmed by the latest studies of third-generation implants in which no IPD has been reported [9]. The common element of all IPDs is the damage of the capturing area of the polyethylene component related to the impingement of the prosthetic femoral neck against the chamfer. Either homogeneous or circular wear of the retentive mechanism or asymmetric damage secondarily can occur [9]. In the setting of a loose socket, wear may be accelerated. We concluded that the complication described in this case report was a true IPD but we believe that the cause of the IPD was incomplete seating of the prosthetic metal head into the mobile polyethylene component, as previously described by Guyen et al in 2009 [8]. Although there is no industry standard defining the impaction force necessary for seating a femoral head onto a stem or for assembly of dual-mobility articulations, strict adherence to the manufacturer's assembly instructions may reduce the risk of IPD. Before reduction, it is essential to ensure that the head is securely seated on the stem and that the mobile bearing moves freely.

A second concern is about the choice of the cemented Lubinus SP II (Link, Hamburg, Germany) stem at the time of revision. That stem is certainly the most implanted in Northern Europe [10]. Nevertheless, using the Lubinus stem, the contact of the third joint is not optimized due to the long taper and a big and rough neck. The diameter of the Lubinus neck is always greater than 14 mm and its surface roughness is 1.5 μm (10; Fig. 1). In 2001, Noyer conducted a study on the mid-term results on DMC and he was able to demonstrate the role of the design and the surface of the femoral stem neck when using DMC [3]. Revisions for IPD, which occurred on average approximately 4 years after implantation, were twice as likely for rougher necks compared to polished necks. IPD was widely reported with the first-generation designs but had occurred less frequently with “friendly neck” designs. These stems have a highly polished (roughness 0.1 μm) and thinner neck, with a head-neck ratio of at least 2 [11].

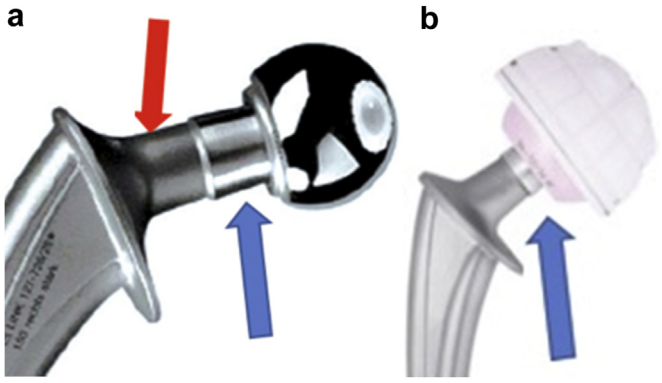

Figure 1. Lubinus stem construct with a 22.2 mm metallic head (a) or a 28 mm ceramic head (b). Blue arrows show that the radius taper is not covered by the head. Red arrow shows the roughness of the neck. (Pictures captured in: From Excellent results with the cemented Lubinus SP II 130-mm femoral stem at 10 years of follow-up; Acta Ortopedica 85; April 2014).

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It is instructive to note that the contralateral hip in the reported patient had an isolated revision to a cemented DMC with retention of a polished Charnley stem, which has had favorable reports in combination with dual-mobility articulations [12-15]. We completely disagree with the authors' statement “Our case and review of the literature may form an argument not to consider DMC for primary cases and placement in younger patients should be performed with caution” as the efficacy of contemporary monoblock implants has been reported [16-21]. In addition, results at more than 10 years in THA in patients less than 55 years have been shown to be excellent without an increase in serum cobalt or chromium levels [22]. To prevent IPD, surgeons must not forget the lessons of the past and should carefully choose which implants they choose in dual-mobility constructs.

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