LETTER TO THE EDITOR

Response to the letter by Daniel Goutallier, Stéphane Le Mouel, Patrice Osorovitz and Marc-Antoine Rousseau

We thank Daniel Goutallier and his collaborators for their critical reading of our recent publication and their insightful comment on the relation between the medullary canal filling rate of Osteal (R) stems and their possible loosening.

First of all, we did not measure the medullary canal filling rate of all the stems in our series. We find this to be a rough measurement, even with good images because this number depends on femoral rotation and the intramedullary extremities of the femoral canal, which are particularly difficult to find on postoperative X-rays of a cemented stem (because the white-out aspect of the cement mantle is confused with the cortical tonality). Moreover, the lateral view is not taken into account. On later radiographs, bone remodeling or interface modifications may be encountered, sources of bias in the appreciation of immediate postoperative filling. At the very least, it can be said that this measurement is not highly reproducible.

Our survival rate at 12 years (and at 10 years) is indeed slightly lower than in the series reported by Mouel et al., but we reported the results only in subjects under 50 years of age, who were therefore more active.

In this series that began in 1993, as we had done before, we sought to obtain excellent stem stability before sealing because we were aware of this “French paradox”, even if it was not as clearly specified at the time as it was later by Mouel et al. in 1998, then Langlais et al. in 2003. The Osteal (R) stem, its quadrangular cross-section, and its different designs and sizes also made it possible to obtain this stability in nearly all cases.

We nonetheless reviewed the files of the three cases of loosening reported in our series, seeking out X-rays with the highest degree of contrast, and we attempted to measure the filling rate 4 cm under the lesser trochanter. In the example given in the Fig. 4 of the article, the filling rate would be 71% on the loosened side (DTE stem, valgus on the right side) and 76% on the non-loosened side (DDN stem on the left side). In the second case of loosening, the filling rate would be 60%. In the third, filling was estimated at 82%.

This implant’s stability is indeed, first and foremost diaphyseal and it does not fill the metaphysis. It therefore transmits to the cement mainly shearing stresses, which indeed increase as the filling rate decreases. We were able to confirm this relation theoretically in a finite element study [1], showing the value of metaphyseal filling with smooth polished stems in generating compression stresses that were better tolerated by the cement. We therefore no longer implant this stem in active patients, and for this reason we have only implanted cementless stems coated in hydroxyapatite since they became available, with no negative consequences on our clinical results to date.

It should be noted that another case of late loosening not within the series (a 55-year-old patient) has been observed since this paper was published.

Disclosure of interest

Philipe Massin received royalties from Wright Medical Ortho and from Ceramconcept.

Reference


P. Massin
Service de chirurgie orthopédique, hôpital Bichat, 46, rue Henri-Huchard, 75018 Paris, France
E-mail address: phmassin@gmail.com