



Letter to the Editor

Letter to the Editor: “Early Survivorship of Newly Designed Highly Porous Metaphyseal Tibial Cones in Revision Total Knee Arthroplasty”

We read with interest the article by Chalmers et al. [1] and congratulate them on their work. They present the early (minimum 2 years) survival of 3D-printed titanium tibial metaphyseal cones used during revision total knee arthroplasty for a case series of 163 patients. However, there are limitations due to the heterogeneity of the cohort assessed, that may not be fully addressed by their regression model, and the problems of reporting survival of an augment when used in combination with total knee prosthesis.

The 2-year survivorship free from any re-revision for aseptic loosening was 100%. In contrast, in the remaining cohort (n = 88), there were 6 nonmodular and a further 10 modular exchange (for infection) revisions. Therefore, the survival rate may be lower for nonaseptic indications, in the region of 82% (n = 72/88) rather than the 96% quoted for the overall patient cohort. However, only one cone was reported to be loose, and this suggests an isolated component survivorship of 99.4%.

This raises the question about the reporting of what could be considered an “additive” component in revision arthroplasty. In this case series, there was considerable heterogeneity in the range of implants used with regard to the method of fixation (74% hybrid, 26% cemented), length of construct, and level of constraint (65% varus/valgus, 32% hinge), all of which may influence the survival of the revision arthroplasty and may not be directly related to potential failure of the cone. In addition, the interaction between these variables and the cone may have unintended outcomes with regard to stress transference or shielding leading to cone failure. We acknowledge that this is the nature of revision surgery and that controlling for one variable is often difficult.

As a point of technical interest, we note from the figures included in the manuscript that long stems were most commonly used, even in cemented constructs. The authors preferred technique is to use short cemented stems, as they facilitate placement of the femoral or tibial components within the confines of the cone, while allowing optimal positioning of the relevant articulations with regard to translation, flexion, rotation, and coverage. The safety and efficacy of this construct have been shown by in vitro studies [2,3] for this specific implant and in vivo studies for similar metaphyseal augment—short-stem constructs [4,5].

We commend Chalmers et al. [1] on their work and hope our comments may help readers interpret their original data and to

simulate discussion on how best to present the survival of specific components used within the construct of a revision total knee replacement, as it would not seem correct to assign failure to the augment used to reconstruct the knee when failure has resulted from another cause.

Conflicts of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

References

- [1] Chalmers BP, Malfer CM, Mayman DJ, et al. Early survivorship of newly designed highly porous metaphyseal tibial cones in revision total knee arthroplasty. *Arthroplasty Today* 2021;8:5.
- [2] Xie S, Conlis N, Hamilton D, Scott C, Burnett R, Pankaj P. Metaphyseal cones in revision total knee arthroplasty: the role of stems. *Bone Joint Res* 2020;9(4):162.
- [3] Xie S, Conlis N, Hamilton D, Scott C, Burnett R, Pankaj P. A finite element analysis of tibial tritanium cones without stems in varying bone defects. *Knee* 2020;27(3):656.
- [4] Jacquet C, Ros F, Guy S, Parratte S, Ollivier M, Argenson JN. Trabecular metal cones combined with short cemented stem allow favorable outcomes in aseptic revision total knee arthroplasty. *J Arthroplasty* 2021;36(2):657.
- [5] Scior W, Chanda D, Graichen H. Are stems redundant in times of metaphyseal sleeve fixation? *J Arthroplasty* 2019;34(10):2444.

Todd Mason, MBBS(Hons), BMedSci, FRACS(Orth), FAOrthA*
 Nick D. Clement, MD, PhD, FRCS Ed (Tr & Orth)
 Richard Burnett, FRCS Ed (Tr & Orth)
 Royal Infirmary of Edinburgh
 Edinburgh, UK

* Corresponding author. 51 Little France Crescent, EH16 4SA, Edinburgh, United Kingdom. Tel.: +44 744 798 6994.
 E-mail address: tddgmsn@gmail.com (T. Mason).

21 April 2021
 Available online xxx