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LETTER TO THE EDITORS

Reply to the letter by J.-Y. Jenny regarding our article "Comparative study of the use of computer assisted navigation system for axial correction in medial unicompartmental knee arthroplasty"

Mui-Hong Lim · Andras Tallay · John Bartlett

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Dear Editors,

We thank Dr. J.-Y. Jenny for his interest in our article [5] and the points raised. Our hypothesis like his was that computer-assisted surgery (CAS) would improve alignment in unicompartmental knee arthroplasty (UKA). However, follow-up assessment did not support the hypothesis.

With regard to his comments on power analysis, we acknowledge that the number of cases in our series was limited to make a definitive conclusion on the role of computer navigation in UKA. Our sample size was similar to his (60 cases) [2] and other published studies [1, 3] in examining the role of navigation in the UKA. Based on the results of coronal femorotibial mechanical angle measurement published by Jenny and Boeri [2], to detect a mean difference of 0.8 degrees with 2.0 degree standard deviation and a 95% confidence level, 246 cases would been required in each arm of the study (conventional and navigated) prospectively if power of 0.8 is assumed. This would require a multi-centre trial.

The differences in the results between our desired mechanical axis range and Kennedy Protocol [4] were due to the difference in definition. Our "desired post-operative mechanical limb alignment" was strict—between 1 degree valgus and 1 degree varus (narrower than Dr Jenny's 0–5 degrees varus). The computer system recorded this in every case after prosthesis insertion and yet based on the CT scanogram hip/knee/ankle assessment by an independent observer that was achieved in 4 out of 21 cases in the non-navigated group and 3 out of 30 cases in the CAS group.

M.-H. Lim (✉) · A. Tallay · J. Bartlett
Warringal Hospital, Melbourne, VIC, Australia
e-mail: write2lim@hotmail.com

The Kennedy Protocol assessment of desired zones 2 & C is much more forgiving occupying 40% of the tibial width but it correlates with clinical outcome and so was included. This was achieved in more than 90% in both groups. Hence, there was no "huge discrepancy". The "Results" description of desired range may have been confusing to the reader and if so we apologise—it was elaborated in the "Discussion" section.

Dr Jenny had asked us to explain why our results were different to his. With the CAS group, there was not much difference. He had similarly found no significant difference in the mean or range of the coronal femorotibial mechanical angle (i.e. mechanical axis) between the two groups, and we each had 9–10 degrees variance between the most varus and most valgus angles.

The most obvious difference between us was in the conventional group. Our variance from most varus to most valgus angles was 9 degrees, whereas his was 20 degrees. Our group was prospective and randomized, whereas he retrospectively selected 30 conventional cases from 256 to match 30 navigated cases. Our resurfacing surgical technique allowed adequate exposure but was not "minimally invasive"; the senior surgeon has more than three decades of experience with UKA; there was minimal bone resection; and alignment was based on restoring the joint line and soft tissue tension with no releases.

One of our aims was to study the correlation between intra-operative limb alignment measurement and post-operative radiological measurement. Results indicated a low correlation rate for both conventional and computer-assisted techniques (19%; 10%). The cause can be debated. We enthusiastically support research into computer-assisted surgery but perhaps our study indicates the need for UKA-specific software and importantly a good foundation in conventional surgical techniques.

References

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