

Reply to Editorial by Mamarelis *et al.*

Jaydev B. Mistry, Randa K. Elmallah, Kimona Issa, Morad Chughtai, Michael A. Mont

Rubin Institute for Advanced Orthopedics, Center for Joint Preservation and Replacement, Sinai Hospital of Baltimore, 2401 West Belvedere Avenue, Baltimore, MD, USA

Correspondence to: Michael A. Mont, MD. Rubin Institute for Advanced Orthopedics, Center for Joint Preservation and Replacement, Sinai Hospital of Baltimore, 2401 West Belvedere Avenue, Baltimore, MD 21215, USA. Email: mmont@lifebridgehealth.org; rhondamont@aol.com.

Submitted Jan 06, 2016. Accepted for publication Jan 07, 2016.

doi: 10.3978/j.issn.2305-5839.2016.01.05

View this article at: <http://dx.doi.org/10.3978/j.issn.2305-5839.2016.01.05>

We read with interest the editorial by Mamarelis *et al.* (1), which evaluated our report entitled “The Effect of Timing of Manipulation Under Anesthesia to Improve Range of Motion and Functional Outcomes Following Total Knee Arthroplasty” (Issa K, Banerjee S, Kester MA, Khanuja HS, Delanois RE, Mont MA. *J Bone Joint Surg Am* 2014;96:1349-57). We thank the authors for their valuable review, in which they have raised several valid points.

The authors noted that several other studies (2-5) have used a ROM less than 90° as an indication for manipulation under anesthesia (MUA), whereas the present study used a threshold of 110°. Because of this, they state that the total number of patients undergoing MUA in this study may be greater, potentially affecting the final mean gains in ROM. Selecting a cut-off for the ROM appropriate for an MUA is challenging and often left to the discretion of the orthopedist. There are no definitive guidelines for acceptable active knee flexion values at 6 weeks after TKA. However, recent literature has demonstrated that ROM greater than 90° is necessary for undertaking many normal activities of daily living. While a ROM of 10° to 95° may be sufficient for walking and sitting (6,7), activities such as ascending stairs (105°), descending stairs (107°), and picking an object up off the floor (117°) require a greater ROM (8). Thus excluding patients with ROM between 90° and 110° may prevent them from benefitting from the advantages of this procedure. Moreover, greater postoperative knee flexion has been associated with higher levels of perceived patient satisfaction, considering patients with less than 110° of flexion were dissatisfied after TKA (9). Thus, we believe that making 110° of flexion our threshold may be more effective at managing patient dissatisfaction with ROM post-surgery.

In addition, Mamarelis *et al.* indicated that while the

report showed a difference in the distribution of patients between early and late MUA groups with regards to patient age, smoking status, and presence of cardiac disease, it did not mention the nature of the distribution. Our purpose was to only elucidate the difference in the proportions of patients in each cohort who had each disease. Furthermore, these variables, such as presence of cardiac disease and smoking status, are categorical variables, therefore making it unfeasible to determine factors such as normal distribution, which is reserved for continuous data.

The authors are in agreement that undergoing early MUA (<12 weeks) is a reasonable first-line treatment for TKA patients who develop arthrofibrosis. We feel that our study design and results are comparable to existing literature (10,11), but also provide further insight into both clinical and patient reported outcomes following early and late MUAs. The authors also questioned whether gains in ROM were maintained over a period of time. We feel that this was accomplished, given that patients were followed for a mean of 51 months (range, 12–81 months). In certain cases, we did not have a hard end-point to motion, but it still may be worth considering performing a MUA after 12 weeks. However, gains in ROM may only be seen in about 50% of patients with only a mean improvement of 17° compared to those who had an early MUA. It is important that physicians inform patients of these potential outcomes when contemplating this treatment method. Once again, we thank Mamarelis *et al.* for their excellent and informative review of this topic as well as this report.

Acknowledgements

None.

Footnote

Conflicts of Interest: MA Mont is a consultant for, or has received institutional or research support from the following companies: Sage Products, TissueGene, OnGoing Care Solutions, DJO Global, Microport, Orthosensor, National Institutes of Health, Stryker, Medical Compression Systems, Johnson & Johnson, Pacira Pharmaceuticals, Merz. He is on the editorial/governing board of the *American Journal of Orthopedics*, *Journal of Arthroplasty*, *Journal of Knee Surgery*, and *Surgical Technology International*. The other authors have no conflicts of interest to declare.

References

- Mamarelis G, Sunil-Kumar KH, Khanduja V. Timing of manipulation under anaesthesia for stiffness after total knee arthroplasty. *Ann Transl Med* 2015;3:316.
- Rubinstein RA Jr, DeHaan A. The incidence and results of manipulation after primary total knee arthroplasty. *Knee* 2010;17:29-32.
- Livbjerg AE, Froekjaer S, Simonsen O, et al. Pre-operative patient education is associated with decreased risk of arthrofibrosis after total knee arthroplasty: a case control study. *J Arthroplasty* 2013;28:1282-5.
- Ipach I, Schäfer R, Lahrmann J, et al. Stiffness after knee arthrotomy: evaluation of prevalence and results after manipulation under anaesthesia. *Orthop Traumatol Surg Res* 2011;97:292-6.
- Gollwitzer H, Burgkart R, Diehl P, et al. Therapy of arthrofibrosis after total knee arthroplasty. *Orthopade* 2006;35:143-52.
- Witvrouw E, Bellemans J, Victor J. Manipulation under anaesthesia versus low stretch device in poor range of motion after TKA. *Knee Surg Sports Traumatol Arthrosc* 2013;21:2751-8.
- Stamos VP, Bono JV. Management of the stiff total knee arthroplasty. In: Bono JV, Scott RD, editors. *Revision Total Knee Arthroplasty*. New York: Springer New York, 2005;251-7.
- Ebert JR, Munsie C, Joss B. Guidelines for the early restoration of active knee flexion after total knee arthroplasty: implications for rehabilitation and early intervention. *Arch Phys Med Rehabil* 2014;95:1135-40.
- Devers BN, Conditt MA, Jamieson ML, et al. Does greater knee flexion increase patient function and satisfaction after total knee arthroplasty? *J Arthroplasty* 2011;26:178-86.
- Ghani H, Maffulli N, Khanduja V. Management of stiffness following total knee arthroplasty: a systematic review. *Knee* 2012;19:751-9.
- Fitzsimmons SE, Vazquez EA, Bronson MJ. How to treat the stiff total knee arthroplasty?: a systematic review. *Clin Orthop Relat Res* 2010;468:1096-106.

Cite this article as: Mistry JB, Elmallah RK, Issa K, Chughtai M, Mont MA. Reply to Editorial by Mamarelis et al. *Ann Transl Med* 2016;4(2):41. doi: 10.3978/j.issn.2305-5839.2016.01.05