

LETTERS

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**Metacarpophalangeal implant surgery: time for a randomized clinical trial? Comment on the article by Chung et al**

*To the Editor*

I read with interest the study on long-term outcome of silicone metacarpophalangeal implant surgery published recently in *Arthritis Care & Research* (Chung KC, Burns PB, Kim HM, Burke FD, Wilgis EF, Fox DA. Long-term followup for rheumatoid arthritis patients in a multicenter outcomes study of silicone metacarpophalangeal joint arthroplasty. *Arthritis Care Res [Hoboken]* 2012;64:1292–300). The study was large, had a long-term followup period, and included a comparator group. However, I have some issues with the analysis strategy used by the authors and their subsequent conclusions.

Because this study is not a randomized trial, the comparison between the groups must be made with great caution. Clearly at baseline, the patients who elected to have surgery had much worse hand function (in all aspects measured) than patients who declined surgery. The improvement in the surgery group is notable and contrasts with the stable course in the control group. However, in my view, the key finding is not (as reported) the difference in change between the groups, but the fact that the surgery group was able to improve to the level of the control group.

It would be interesting to learn the results of surgery performed in the subgroup of patients with hand function as good as the nonsurgery group at baseline. Did the patients in this subgroup show as much improvement as the patients with worse hand function? Also, the decrease in improvement over time suggests that a stable state was not reached and the surgery group needed to be followed up for even longer.

Finally, the analysis comparing the outcomes of the study (surgical) hand with the contralateral (nonsurgical) hand was unfortunately only briefly described and shown in a supplementary table. I think this analysis has greater validity than the main analysis because the variability between the hands of one patient is likely to be less than the variability between the hands of separate patients. For instance, the contralateral hand is more likely to also show poor function and thus more resemble the surgical hand. Also, the influences working at the patient level are likely the same in both hands. Supplementary Table 1 of the article did not show the baseline data for the nonsurgical hand; however, it did show that the surgical hand improved or maintained function better than the control hand, confirming the main study findings. Interestingly, the supplementary table also confirmed a finding not highlighted by the authors. In the main analysis, grip strength was, not unexpectedly, less at baseline in the hands of the surgical group compared to the hands of the control group.

However, grip strength increased more in the control group than in the surgical group, and this was mirrored in the within-patient analysis; namely, grip strength increased in both hands, but more in the nonsurgical hands than in the surgical hands ( $P = 0.06$ ).

In conclusion, this study adds to our knowledge of the pros and cons of silicone implant surgery. Readers should certainly look at Supplementary Table 1. Overall, I think there is enough equipoise to perform a randomized trial on the balance of benefit and harm of this procedure.

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**Reply**

*To the Editor:*

We appreciate the comments by Dr. Boers about our article and his interest in our research. Although the original intent for our study of the outcomes following silicone metacarpophalangeal arthroplasty (SMPA) was to perform a randomized controlled trial (RCT), we found this approach was not feasible. Because of strong patient preferences, the likelihood of meeting our enrollment quota in an RCT would have been seriously compromised. Additionally, there is the ethical decision to consider when randomizing patients with rheumatoid arthritis who present with severe deformities but have a high level of function. Whether this type of rheumatoid arthritis patient should have surgery is questionable.

We agree that this cohort should be followed up for a longer period to document the outcomes over time. To facilitate this, we have received additional funding from the National Institute of Arthritis and Musculoskeletal and Skin Diseases and will follow this group for an additional 4 years, bringing our total followup time for this cohort to 7 years. The first 3 years of the study have provided valuable results and we expect that this further followup will do likewise.

Dr. Boers also indicated that it would be interesting to learn the results of surgery on the subgroup of patients who had hand function as good as the nonsurgery group at baseline. First, although the control patients showed higher function on average, for most measures, the ranges of the control patients were wider than the ranges of the SMPA patients. For example, the overall Michigan Hand Outcomes Questionnaire (MHQ) scores at baseline ranged from 3–96 in non-SMPA patients, whereas the scores ranged from 10–84 in SMPA patients after surgery. Similarly, the range for grip strength in the study hands was 0–34.7 in the non-SMPA group and 0–28.3 in SMPA group.

Second, our propensity-stratified estimate was based on a similar statistical approach to such a subgroup analysis

in which we estimated between-group 3-year outcomes after trimming patients in nonoverlapping propensity regions. The propensities for receiving the operation were estimated using a logistic regression model with various baseline patient characteristics including baseline values of various outcome measures. Therefore, trimming patients in nonoverlapping regions of propensity essentially excluded patients who were not comparable at baseline. After trimming, this analysis used a smaller subset of 59 patients whose propensities for receiving the operation were comparable. As reported in the article, the propensity-stratified estimate for the 3-year overall summary score was 14.8 points higher in the SMPA patients than in non-SMPA patients, showing that in patients whose propensities for receiving the operation were similar, a significant improvement was expected in the SMPA group compared with the non-SMPA group based on MHQ scores.

Last, Dr. Boers commented on the data in Supplementary Table 1 of our article that compared the change in mean values for outcome variables in the surgical hand and the control hand. This within-person comparison controlled for the baseline difference noted in the surgical and nonsurgical groups to some extent. However, subjects could pick which hand would receive surgery and the study hand was often worse in appearance and function than the control hand. For example, overall mean baseline MHQ scores were 48 for unoperated hands and 37 for operated hands in the SMPA group and 61 for unoperated hands and 56 for operated hands in the non-SMPA group. Although not statistically significant, it is not clear why grip strength increased more in the control group than in the surgical group or, similarly, why grip strength increased more in control hands than in surgical hands in SMPA patients. However, these results highlight the importance of patient-reported outcomes over physical measures such as grip strength in assessing outcomes following surgery.

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### **Assessment of hand involvement in systemic sclerosis by ultrasonography: comment on the article by Elhai et al**

*To the Editor:*

We read with great interest the article by Elhai et al on the potential role of ultrasonography (US) in the assess-

ment of hand involvement in systemic sclerosis (SSc) published recently in *Arthritis Care & Research* (1). During the course of their disease, SSc patients often experience skeletal hand involvement, which is primarily assessed by clinical examination and radiographs. As the authors noted, skeletal hand involvement is underestimated in SSc, thus supporting the potential role of US in the assessment of hand involvement in SSc. The data provided by Elhai et al are in agreement with previous reports (2–4) showing the complementary role of US in assessing the broad spectrum of hand conditions in SSc patients, particularly synovitis and tenosynovitis.

Regarding inflammatory joint involvement, the authors described in depth the clinical aspects (i.e., swollen and tender joints), the US findings (i.e., the distribution and activity of synovitis), and the radiologic findings (i.e., distribution of joint space narrowing and erosions) even if these aspects were studied singularly. Considering the different features of hand involvement, it would be of great interest to classify these findings as previously reported by the same authors as patterns rather than single aspects (5).

It is worth commenting on the observations made by the authors regarding fibrotic US tenosynovitis and its association with the detection of tendon friction rubs (TFRs). Previous studies on this topic have also revealed that thickening of the A1 pulley, an increased thickness of the retinacula by US (4,6,7), and connective tissue infiltrates by magnetic resonance imaging might correspond to the anatomic substrate of TFRs and be a hallmark of a more severe connective tissue involvement in SSc patients. All of the findings by Elhai et al were so closely associated with TFRs to suggest that this was the lesion underlying the sign (8).

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1. Elhai M, Guerini H, Bazeli R, Avouac J, Freire V, Drape JL, et al. Ultrasonographic hand features in systemic sclerosis and correlates with clinical, biologic, and radiographic findings. *Arthritis Care Res (Hoboken)* 2012;64:1244–9.
2. Cuomo G, Zappia M, Abignano G, Iudici M, Rotondo A, Valentini G. Ultrasonographic features of the hand and wrist in systemic sclerosis. *Rheumatology (Oxford)* 2009;48:1414–7.
3. Ingegnoli F, Boracchi P, Soldi A, Ingegnoli A, Gualtierotti R, Galbiati V, et al. The role of ultrasonography in the assessment of skeletal hand involvement in systemic sclerosis [letter]. *J Med Ultrasound* 2011;19:141–2.
4. Cuomo G, Zappia M, Iudici M, Abignano G, Rotondo A, Valentini G. The origin of tendon friction rubs in patients with systemic sclerosis: a sonographic explanation. *Arthritis Rheum* 2012;64:1291–3.
5. Avouac J, Guerini H, Wipff J, Assous N, Chevrot A, Kahan A, et al. Radiological hand involvement in systemic sclerosis. *Ann Rheum Dis* 2006;65:1088–92.
6. Wakefield RJ, Balint PV, Szkudlarek M, Filippucci E, Backhaus M, D'Agostino MA, et al, for the OMERACT 7 Special Interest Group. Musculoskeletal ultrasound including definitions for ultrasonographic pathology. *J Rheumatol* 2005;32:2485–7.
7. Tagliafico A, Panico N, Serafini G, Ghio M, Martinoli C. The thickness of the A1 pulleys reflects the disability of hand