To the Editor:

I believe that the article “Reverse shoulder arthroplasty glenoid fixation: is there a benefit in using four instead of two screws?” published in the Journal of Shoulder and Elbow Surgery in August 2013 contains methodological issues that call the results and conclusions into question. In addition, the authors reach conclusions that are not supported by their results. Specifically, the study conclusion that “using fewer screws could potentially lead to a reduction in operative time, cost, and risk, with no significant negative effect on overall implant baseplate motion” was not supported by the results of this underpowered study. The conclusion is overreaching, given that no cost-benefit analysis or time savings comparison was even presented in the text. Most concerning, this conclusion may incorrectly influence orthopaedic surgeons to change their clinical practice regarding the number of screws they use to secure the glenoid baseplate during reverse total shoulder arthroplasty (rTSA), potentially increasing the risk of aseptic glenoid loosening, one of the more common failure modes of rTSA.

Regarding the study’s methodological issues, the maximum number of loading cycles was only 300, and it is not clear why the authors chose this. Three consecutive series of only 100 cycles is extremely short and does not realistically mimic the clinical situation. The results show uniformly that the glenoid displacement was greater for 2 versus 4 screws up to 100 cycles, but the differences were not statistically significant — although they likely would have been if the study was sufficiently powered, given that “Statistical increases in average peak central displacement with increasing load (P < .001) and with repetitive loading (P < .002) were found.” In addition, the loading protocol was unusual and not particularly clinically relevant. The authors “arbitrarily doubled the compressive force levels so that a desired maximum compressive force of 1300 N was planned for each loading profile.” This magnitude of compressive loading without similar increases in the applied shear load far exceeds that of previously published studies of loading with rTSA.

Finally, the authors concluded that “the two most important screws for glenoid-baseplate fixation in rTSA are the superior and inferior screws.” The authors did not attempt to quantify fixation with only anterior and posterior screws; therefore, this conclusion is not based on any supporting data. The study methodology also did not actually compare the same type of screws to achieve fixation. When 4 screws were used, it was a combination of 2 locking and 2 nonlocking screws; whereas when 2 screws were used, they were both locking screws. Had the methodology been different and the study sufficiently powered, the authors may have instead found that the type of screw fixation, not the number of screws or location of screws, was significant with the particular baseplate design tested.

For all these reasons, I believe that clinicians should be skeptical of these results and not make any clinical decisions based on them.

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References