

Pedicle screw fixation in minimally invasive transforaminal lumbar interbody fusion

TO THE EDITOR: Recently, we read the article by Choi and colleagues¹ with great interest (Choi UY, Park JY, Kim KH, et al: Unilateral versus bilateral percutaneous pedicle screw fixation in minimally invasive transforaminal lumbar interbody fusion. *Neurosurg Focus* 35(2):E11, August 2013). We appreciate the authors for the results they report, which are a worthwhile contribution to resolve the controversial issue on the choice between unilateral or bilateral constructs in transforaminal lumbar interbody fusion for degenerative lumbar disorders.

However, we have to point out a statistical mistake in this article, which probably affects the accuracy of the conclusion. As the authors reported, fusion was achieved in 22 cases in the unilateral screw group (n = 26), and in 26 cases in the bilateral screw group (n = 27). We used the Fisher exact test that the article described to assess the difference in fusion rates between the two groups, and we found that there was no significant difference. With respect to the scoliotic changes they mentioned in the article, 23.07% of patients were observed in the unilateral screw group (6 of 26) and 3.7% in the bilateral screw group (1 of 27). We obtained a controversial result by using chi-square continuous correction tests or Fisher exact tests, respectively. Due to the fact that the sample size was larger than 40, and the theoretical frequency of these data was no less than 1 and less than 5 simultaneously, we thought that it was appropriate to use the chi-square continuous correction test to compare the differences between the two groups regarding scoliotic changes. Based on the design of the study, it also seems unsuitable for using McNemar tests to evaluate the radiological results between the two groups.

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Disclosure

The authors report no conflict of interest.

Reference

1. Choi UY, Park JY, Kim KH, Kuh SU, Chin DK, Kim KS, et al: Unilateral versus bilateral percutaneous pedicle screw fixation in minimally invasive transforaminal lumbar interbody fusion. *Neurosurg Focus* 35(2):E11, 2013

RESPONSE: Thank you for your interest and the good comment on our article. In our paper, we reported that fusion rates were 84.61% (unilateral screw) versus 96.29% (bilateral screw), and fusion rates were significantly different between groups (between-group comparisons with Fisher exact test or McNemar test, $p < 0.01$). As the readers commented, if we use the Fisher exact test, the p value will be 0.192 and there will be no significant difference in fusion rates between the groups. However, if we use the McNemar test, the p value will be 0.000. We also carefully discussed our statistical analysis, and we concluded that the fusion rate showed binominal distribution, so we think that the McNemar test is better than the Fisher exact test.

About scoliotic change, the readers commented that because the sample size was larger than 40, it was appropriate to use the chi-square test. Although the total sample size (n = 53) was larger than 40, the individual sample size (unilateral screw = 26, bilateral screw = 27) was less than 30. If the individual sample size is larger than 30, the chi-square test is appropriate. Because the individual sample size was less than 30, a nonparametric test like the Fisher exact test or the McNemar test was appropriate in this study. As we commented in the paper, there were a small number of cases in each group and further studies with large study populations are needed. Thank you again for your good advice and interest in our paper.

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