LETTERS TO THE EDITOR

Segmental mobility and heterotopic ossification after cervical arthroplasty

TO THE EDITOR: We read with great interest the recent article by Chang et al.1 (Chang HK, Chang CC, Tu TH, et al: Can segmental mobility be increased by cervical arthroplasty? Neurosurg Focus 42(2):E3, February 2017) in which they analyzed the radiographic and clinical outcomes of cervical disc arthroplasty (CDA) using the Prestige LP prosthesis. They retrospectively reviewed 50 consecutive patients who had undergone 1-level CDA for the treatment of cervical degenerative disc disease and spondylosis. They reported, for the first time, the changes in segmental mobility (ΔROM) from preoperatively to postoperatively and their influence on outcomes. They concluded that patients with increased segmental mobility (ΔROM > 0°) had significantly less heterotopic ossification (HO) and similarly improved clinical outcomes as compared to those in patients with decreased segmental mobility (ΔROM < 0°). However, in our opinion, given their results, we cannot conclude whether the decreased segmental mobility influenced the formation of HO or the formation of HO caused the decrease in segmental mobility.

In their study, they reported that once ΔROM were determined postoperatively, patients were then divided into 2 groups: the group with increased segmental mobility (ΔROM > 0°) and the group with decreased or unchanged segmental mobility (ΔROM < 0°). Their results demonstrated that the postoperative reduction in segmental mobility (ROM) was significantly correlated (p = 0.012) with the formation of HO. However, the results of ΔROM were calculated using the differences between ROM at the final follow-up (> 24 months) and preoperation instead of the differences between ROM when patients were divided into groups and preoperation. Thus, given the results, we can only conclude that decreased segmental mobility is correlated to HO, but we cannot determine whether the decreased segmental mobility influenced the formation of HO or the other way around. McAfee et al.2 introduced the classification of HO in 2003. According to that classification, Grades 3 and 4 HO can cause the decrease in segmental mobility. Furthermore, what was the average postoperative time that the patients were divided into different groups? The index segment may have already had HO, which could be the main reason for the decrease in segmental ROM.

In conclusion, we applaud and congratulate Chang et al.’s remarkable work. They reported for the first time the correlation between changes in segmental mobility (ΔROM) and HO. However, we cannot determine whether the decreased segmental mobility influences the formation of HO or the HO causes the decrease in segmental mobility. This debate needs further study in the future.

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References

Disclosures
The authors report no conflict of interest.

Response
We read with interest Dr. Zeng and colleagues’ comments on our article. In our paper, we concluded that segmental mobility (as reflected by the mean ROM) and overall cervical alignment (that is, the mean sagittal vertical axis [SVA] and C2–7 Cobb angle) had no significant impact on the clinical outcomes of 1-level CDA, and that patients with increased segmental mobility (ΔROM > 0°) had significantly less HO and similarly improved clinical outcomes compared to those in patients with decreased segmental mobility (ΔROM < 0°).

The actual cause of HO formation following CDA remained elusive. Suggested etiologies of HO included pre-existing cervical spondylosis, multilevel disc disease, and suboptimal installation of the device.1,3,9,10,12,14 Our series, as with many published FDA trials,2,4–6,11 demonstrated that most of the CDAs successfully preserved segmental mobility from immediate postoperation up to 2–5 years.
thereafter, whether or not there was HO formation. Although the HO seemed not to affect the clinical success of CDA in the study period in many studies,\textsuperscript{1,8,9,12–14} most spine surgeons would attempt to avoid its formation. Our study at the very least provides evidence that spine surgeons who perform CDA should aim for the avoidance of decreased segmental mobility ($\Delta$ROM < 0°) and, if possible, try their best to increase ROM ($\Delta$ROM > 0°) after a single-level CDA. However, an increased ROM ($\Delta$ROM > 0°) might not always be achievable in CDA because there could be limitations, such as inadequate resection of bilateral uncovertebral joints, an improperly installed device, and pre-existing ankylosis.\textsuperscript{7,10} It can never be overemphasized that the success of CDA depends on choosing the right patients for surgery and performing the surgery correctly.

References


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