



Answer to the Letter to the Editor of T. Xie et al. concerning “Indirect foraminal decompression and improvement in the lumbar alignment after percutaneous cement discoplasty” by Laszlo Kiss et al. (Eur Spine J; 28(6):1441–1447)

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Thank you for your interest in our paper entitled ‘*Indirect foraminal decompression and improvement in the lumbar alignment after percutaneous cement discoplasty*’. Your comments and questions are very important and clear. We hope that our answers increase the value of our paper as well.

Regarding the first concern about the use of lumbar X-rays instead of full-spine lateral standing films for the measuring of spinopelvic radiological parameters, we do not agree about the possible risk for deviations and bias. To our knowledge, there is no study to show that for lumbopelvic parameters the lateral lumbopelvic X-ray is biased. In our study, lumbar X-rays were performed in the same standard standing position as full-spine X-rays are made. We focused on lumbopelvic parameters and PCD-related changes, and full-spine alignment and sagittal balance were not analysed. In a previous paper, Moon et al. in 2015 compared the lateral cervical and full-spine radiographs. They found that the angular and linear numerical differences between the two radiographic views were smaller than the inter- and intraobserver errors of measurement for the two radiographic views.

The second point of the letter is an important statement. The cement intake, the amount of injected cement—and also its intervertebral distribution—could lead to dimensional changes. Our measurements were X-ray based, which are summated 2D images. This method is not a reliable option to measure the volume-dependent three-dimensional changes. A new, patient-specific 3D method is needed to evaluate the relationship between cement intake and volumetric change of the neuroforamen. Our research group is currently

working on the 3D measurements, which can provide further evidence on the use of PCD technique.

We had interpreted our results of segmental changes in three aspects: global changes (all segments included) and segments with/without PCD. The procedure-related changes in segmental scoliosis did correlate positively with the change of LBP in our cohort. In single-level PCDs, the change in outcome represents the direct effect of the procedure ($\rho = 0.375$ for the correlation between sS and LBP in single-level PCD cases), while in case of a multisegmental PCD, the outcome is associated with the global effect of the procedure; however, the correlation was calculated for the measured change of segmental sS values and the patient’s pain. As seen in the results, PCD procedure has an impact not only on the treated segment(s), but on the whole lumbar spine. We did not focus on individual patient-specific changes as the applied statistical methods (Pearson’s/Spearman correlation) require a larger sample size.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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