



Editorial



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See the article “The Incidence of Adding-On or Distal Junctional Kyphosis in Adolescent Idiopathic Scoliosis Treated by Anterior Spinal Fusion to L3 Was Significantly Higher Than by Posterior Spinal Fusion to L3” via <https://doi.org/10.14245/ns.2142182.091>.



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Commentary on “The Incidence of Adding-On or Distal Junctional Kyphosis in Adolescent Idiopathic Scoliosis Treated by Anterior Spinal Fusion to L3 Was Significantly Higher Than by Posterior Spinal Fusion to L3”

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The selection of a fusion area is the most critical process in the surgical treatment for adolescent idiopathic scoliosis. Especially, the selection of the lower instrumented vertebra (LIV) will influence the correction of unfused curves and trunk balance, which may have significant impact on long-term clinical results. An inadequate selection of LIV may cause adding-on phenomenon (AO) and distal junctional kyphosis (DJK), and decompensation. In the previous reports, the factors related to the postoperative distal adding-on were bone maturity, type 1A-R or L, and the position of LIV.¹ Usually, the selection of LIV is determined by the relative position of a neutral vertebra (NV), stable vertebra (SV), end vertebra (EV), and last touching vertebra (LTV).

To discuss this topic, we have to separate patients with the major curve in the thoracic spine (Lenke type 1 or 2) and those with the major curve in the thoracolumbar/lumbar spine (Lenke type 5 or 6). Regarding the patients with the major thoracic curve, Matsumoto et al.² evaluated 112 patients who underwent posterior spinal fusion (PSF) for Lenke type 1A curve. Postoperative distal AO was observed in 19% of the patients, and the logistic regression analysis revealed that LIV shorter than LTV was a significant risk factor for AO. The selection of LIV in relation to LTV also be applicable in Lenke type 2 curve.³ For patients with the major lumbar curve (Lenke type 5), the selection between L3 or L4 is a debatable issue. The level of LIV level has been chosen at lower EV (LEV), LEV+1, and LEV-1, depending on the magnitudes of curves.⁴⁻⁷

The study design of the present study⁸ is unique. The authors focused on the patients whose LIV were selected at L3 regardless of the surgical approach (anterior or posterior) and curve types, then evaluate the risk factors for AO or DJK. However, the present study has several issues to be considered.

First, the authors only described that the anterior spinal fusion (ASF) group included more type 5 and type 6. To discuss the superiority between ASF and PSF, the background of the patients, including curve type, should be similar.

Second, the postoperative shoulder imbalance was not evaluated in the present study. If the cases included in the study are all type 5 curves, the authors do not need to assess the postoperative shoulder imbalance since it is rare.⁹ While, if patients with major thoracic curves were included, it would be ideal to evaluate shoulder imbalance since AO and shoulder imbalance is related to each other.²

Third, the detail of the Lenke types was not described in the present study. I supposed that the PSF group included patients with the major thoracic curve and that the ASF group included those with the major thoracolumbar/lumbar curve, considering the large difference in mean number of fused vertebrae between the 2 groups (4.6 vs. 11.4). Even in patients with the major thoracic curve, the reason to extend the fusion to L3 has huge differences among the lumbar modifier A, B, and C. While, in some patients with major lumbar curves, LIV was selected at L3 to preserve motion segment, knowing the possibility of the residual curve at L3–S. To use the results of the present study in the clinical setting, the details of materials including Lenke types and lumbar modifiers would help the readers understanding the results of the study.

In spite of these issues of the study, the authors should be commended for this valuable study. Of note, the total stability score, the sum of gravity and rotational stability score, is the most commendable topic of the present study. The authors defined the gravity stability score using the relative position of SV, and the rotational stability score using the relative position of NV, and the total stability score as the summation of the 2 scores. I hope that these simple new parameters will be tested for clinical significance in determination of LIV in each Lenke curve type by future research.

CONFLICT OF INTEREST

The author has nothing to disclose.

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Title: Bottle, glass, fork
Artist: Pablo Picasso
Year: 1911-1912
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