Dynamic pedicle-based stabilization: a true blessing?

TO THE EDITOR: We read with great interest the study published by Meyer et al., which compared the outcome following lumbar fusion versus pedicle-based dynamic stabilization (Meyer B, Thomé C, Vajkoczy P, et al. Lumbar dynamic pedicle-based stabilization versus fusion in degenerative disease: a multicenter, double-blind, prospective, randomized controlled trial. J Neurosurg Spine. 2022;37(4):515-524). We would like to extend our heartfelt congratulations to the team for the design and conduct of this trial. However, we want to address a few issues.

Lumbar interbody fusion techniques ensure a 360° fixation and also address anterior pathology like a prolapsed intervertebral disc. Restoration of disc height leads to indirect decompression of the foramén with improvement in radicular pain. Fujimori et al. have demonstrated that transforaminal lumbar interbody fusion leads to better improvement of pain in patients with spondylolisthesis compared with posterolateral fusion. As Meyer et al. stated that they did not access the anterior column, were patients with prolapsed intervertebral discs excluded from the study?

The success rate was calculated based on improvement in Oswestry Disability Index (ODI) scores by 15% at the end of 24 months, which is low. Austevoll et al. recommended using an ODI score improvement of 30% from baseline. The SPORT (Spinal Patient Outcomes Research Trial) has demonstrated an average improvement in ODI score of 24 in patients with lumbar spondylolisthesis 2 years after surgery. In the lumbar canal stenosis component of the study, the average improvement in ODI in the surgical group was 20.5. Therefore, at least a 20% improvement should be expected following surgery.

Dynamic stabilization is expected to avoid adjacent-segment disease. However, 5 patients in the dynamic stabilization group developed adjacent-segment degeneration as opposed to 4 patients in the fusion group. Donnally et al., in their meta-analysis on adjacent-segment disease following lumbar fusion versus motion-preserving procedures, reported no statistically significant difference between the two groups. This puts into perspective the aim of performing dynamic stabilization. Also, since the recruitment ended in 2015, 7-year follow-up data on the study participants would have given a better picture.

One of the strong advantages of dynamic stabilization conveyed in this study was the shorter duration of surgery and less blood loss. However, neither of these had any effect on the outcome in terms of blood transfusion requirement and duration of hospital stay. So, does this numerical advantage have any significant effect barring the operative costs?

One of the greatest shortcomings of this study is a lack of follow-up imaging. In the group of patients with dynamic stabilization who did manage to improve, we cannot deduce if the result was due to induction of fusion or if it was due to preservation of motion per se. As pointed out by the authors, unintended facet arthrodesis was observed in 52.1% of the patients following Dynesys dynamic stabilization as reported by Fay et al. Also, a screw pullout rate of 19.7% has been reported by Ko et al. following dynamic stabilization. Both could have been assessed on follow-up CT.

We highly commend the authors on recognizing some of these shortcomings and we hope to see the long-term follow-up results from the study.

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**Disclosures**

The authors report no conflict of interest.

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**Response**

We appreciate the interest of Gaonkar and colleagues in our work and their efforts in pointing out the obvious, that is, that no clinical study will ever be perfect when looked at in retrospect. However, we take issue with some points they raised.

In low-grade degenerative instabilities of the lumbar spine, anterior support is not needed to achieve the same functional results as with posterior surgery alone. This is exactly the point our study proves with the to-date best available level of evidence for dynamic/semirigid systems and the reason why many spine surgeons rely on instrumented posterolateral fusion.


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