

# Letter to the Editor: Clinical Implication of Mid-Range Dynamic Instability in Lumbar Degenerative Spondylolisthesis

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To the editor,

With great interest, we read an article entitled “Clinical implication of mid-range dynamic instability in lumbar degenerative spondylolisthesis” by Lee et al. [1]. We congratulate the authors for their laudable work. They observed mid-range instability in three patients who did not have terminal range instability. They suggested that “occult dynamic instability” could be revealed using mid-range instability X-rays. However, we seek clarification on a few concerns.

(1) The authors have evaluated the standing lateral radiographs taken in extension, 45° of flexion (mid-range) and 90° of flexion (terminal range) of the lumbar spine. It is important to explain to the readers how the range of motion was measured. Studies have shown that the flexion of the lumbar spine ranges up to 60° in normal adults [2-6]. In fact, Sullivan et al. [7] in his study on measurement of lumbar range of motion using an inclinometer in 1,126 healthy subjects reported an average range of flexion of 22° to 26° depending on the age. If there is an associated back pain due to lumbar spondylolisthesis, the range of motion would reduce further. As the authors have considered 60° as mid-range of flexion, the technique of measuring the range of motion deserves mention.

(2) The authors have mentioned that they attempted to make the lower leg straight from the pelvis for the radiographs. The representative images “2” and “3” clearly show that in the terminal range X-rays, the sacrum and pelvis are tilted forward, suggesting that the movement occurred at the pelvis and not in the lumbar spine. The pelvis has to be fixed to isolate the motion at the lumbar spine. If pelvic motion is also accounted for, the authors may explain the changes in the lumbar spine that occur with pelvic motion.

(3) In the representative image 2, the posterior vertebral line is not visible, possibly because of the vertebral rotation. This could lead to measurement errors, particularly, when the difference is in millimeters. The sagittal displacement measurements have to be taken on a true lateral view with the posterior vertebral line clearly visible. The authors may explain how they accounted for these imaging errors.

(4) With only three patients showing dynamic instability in the mid-range but not in the terminal range, how could the authors justify concluding the relationship between body mass index and mid-range instability, particularly, keeping in view the incidence of lumbar degenerative spondylolisthesis?

(5) It would be interesting for the readers if the authors

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could explain/hypothesize the reason for “occult” motion in the lumbar spine.

Again, we compliment the authors for their commendable work and hope that this study would incite further research into the “occult” instability in the lumbar spine.

### Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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