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LETTER TO THE EDITOR

Factors influencing the measurement of sagittal spinopelvic alignment in patients with vertebral fractures

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Letter to the Editor:

We have read the insightful study by Plais et al. [1], which focusesQuery on sagittal spinopelvic alignment, including pelvic incidence (PI), lumbar lordosis (LL), thoracic kyphosis (TK), and sagittal vertical axis (SVA), in patients with osteoporotic vertebral fractures (OVF). The authors concluded that fractures at the L3–L5 and/or multiple fractures at the T10–L2 are risk factors for sagittal malalignment (i.e., PI-LL > 8.3°, LL-TK < 2.1°, SVA > 65.8 mm [2]) in patients older than 70 years old. However, we have two concerns regarding the measurements of sagittal spinopelvic alignments.

First, degenerative lumbar spondylolisthesis was not considered, which is associated with both sagittal malalignment and OVF. Kobayashi et al. [3] found that patients with degenerative lumbar spondylolisthesis had larger SVA than those without degenerative lumbar spondylolisthesis ($52.6° \pm 43.3°$ vs. $12.8° \pm 22.0°$, $p < 0.05$); this is partially explained by the fact that anterolisthesis, which is theoretically associated with larger SVA, has a higher prevalence than retrolisthesis [4]. Furthermore, Wang et al. [5] found that lumbar spondylolisthesis was a risk factor for OVFs. Therefore, we recommend investigating degenerative lumbar spondylolisthesis in their study.

Second, there may be some measurement bias of sagittal spinopelvic alignment due to the influence of the OVF itself and measurement position (e.g., supine, seated, and standing position). To be more precise, OVF at T1 can result in overestimate of TK, while OVF at L1 can lead to underestimate of LL by their kyphotic angles. Furthermore, PI is an anatomical parameter that does not change with posture, but LL, TK, and SVA are positional parameters that change with posture. For instance, we found that the mean difference between the standing and deep-seated LL angles was 48° [6]. These factors can significantly impact the results and are recommended to be clearly defined in their study.

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Declarations

Conflict of interest Takaomi Kobayashi, Tadatsugu Morimoto, and Masaaki Mawatari declare no competing financial interests.

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