

[Introduction] Lumbar segmental instability has a negative impact on clinical outcomes of decompression alone procedure for lumbar spinal stenosis (LSS). Both facet joint opening (FJO) on computed tomography (CT) and facet joint effusion (FJE) on magnetic resonance imaging (MRI) have been reported as indicators for the segmental instability by lumbar facet joint on LSS. However, no study has investigated both evaluations at the same study. Therefore, it has not been clarified which is the better evaluation or its impact on clinical outcomes after surgical treatment. [Aim] The purpose of this study was to investigate the relationship between FJO and FJE in patients undergone less-invasive decompression procedures for LSS and to investigate those impacts on clinical outcomes. [Methods] This study included 1465 lumbar levels (L1-2 to L5-S) of 293 patients who underwent less-invasive surgery for LSS and have followed up ≥ 5 years. The FJO was defined as ≥ 2 mm interval on the axial image in preoperative CT. The FJE was evaluated by fluid effusion on the facet joint by axial T2 weighted images of preoperative MRI. The characteristics and distribution of FJO and/or FJE were investigated with preoperative other radiological findings. Association between revision surgery and FJO/FJE were analyzed by intervertebral level using multiple logistic regression analysis included other radiological parameters as potential confounders. [Results] The FJO was observed in 402 levels (27%) and the FJE was in 306 levels (21%). FJO and FJE were divided into 4 groups by those combinations (Figure). The correspondence rate between the FJO and the FJE was 70% (kappa 0.195, $p < 0.01$). There were 137 levels (9%) that showed FJO(+) and FJE (+). FJO(+)/FJE(+) were more common in levels with lateral olisthesis, lateral wedging, and axial intervertebral rotation than the others ($p < 0.001$). The FJO(+)/FJE(+) were associated with revision surgery (odds ratio 2.42 $p = 0.027$) in the multivariate analysis. [Conclusion] The correspondence rate between FJO and FJE was not high. However, multivariate analysis showed levels of FJO(+)/FJE (+) had a more negative impact on the revision surgery than other radiological findings like lateral olisthesis, lateral wedging, or axial intervertebral rotation. Levels of FJO(+)/FJE(+) should be carefully selected surgical strategies.

