

tal mid-vertebral body height were significantly different between cases and controls (all  $p < 0.05$ ). Narrower interpedicular distance and AP dural sac diameter were associated with DSS (odds ratio [OR], 0.506–0.745;  $p = 0.001$ –0.002). Lamina angle (OR, 1.127;  $p = 0.002$ ) and right facet joint angulation (OR, 0.022;  $p = 0.002$ ) were also associated with DSS. No association was observed between disc parameters and DSS.

**Conclusions:** From this large-scale cohort, the canal size is found to be independent of subject body habitus. Other than spinal canal dimensions, abnormal orientations of lamina angle and facet joint angulation may also be a result of developmental variations, leading to increased likelihood of DSS. Other skeletal parameters are spared. Besides, there is no relationship between DSS and soft tissue changes of the spinal column, which suggested DSS is a unique result of bony maldevelopment. Findings should be validated in other ethnicities and populations.

## PS-FP-2-2

### Increased Population Risk of Radicular Leg Pain in Lumbar Developmental Spinal Stenosis

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**Purpose:** Low back pain (LBP) and radiating leg pain are two common health problems around the world. Lumbar developmental spinal stenosis (DSS) may play an important role in pain generation. It is described as pre-existing narrowed vertebral canals at multiple lumbar levels with earlier onset of neurological compromise. Therefore, this study was designed to assess the interaction of DSS and different radiological phenotypes in producing LBP, radiating leg pain and disability.

**Methods:** This was a population-based study of 2,206 subjects with L1–S1 axial and sagittal magnetic resonance imaging (MRI). Clinical and radiological information regarding subjects' demographics, workload, smoking habit,

anteroposterior (AP) vertebral canal diameter, spondylolisthesis, and other MRI phenotypes was assessed. Mann-Whitney U-test and chi-square test were conducted to search for differences between subjects with and without DSS. Associations of LBP and radicular pain in the past month and the past year with the clinical and radiological information were also investigated by utilizing univariate and multivariate logistic regressions.

**Results:** Of the 2,206 subjects, 153 had DSS. Subjects with DSS had higher prevalence of radicular leg pain, more pain-related disability and lower quality of life (all  $p < 0.05$ ). Subjects with DSS had 1.5 (95% confidence interval [CI], 1.0–2.1;  $p = 0.027$ ) and 1.8 (95% CI, 1.3–2.6;  $p = 0.001$ ) times higher odds of having radicular leg pain in the past month and the past year, respectively. However, DSS was not associated with LBP. Instead, subjects with spondylolisthesis had 1.7 (95% CI, 1.1–2.5;  $p = 0.011$ ) and 2.0 (95% CI, 1.2–3.2;  $p = 0.008$ ) times more likely to experience LBP in the past month and the past year, respectively.

**Conclusions:** This large-scale study identified DSS as an independent risk factor of acute and chronic radicular leg pain, and worse disability. DSS is a predictor of radicular pain, and spondylolisthesis is a predictor of LBP. There is an increased likelihood of nerve root compression due to a pre-existing narrowed canal. These subjects are also more likely to have poorer disability and quality of life.

## PS-FP-2-3

### Effects of Bone Cement Augmentation for Upper Instrumented Vertebra on Adjacent Segment Degeneration in Lumbar Fusions

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**Purpose:** This study aims to investigate the long-term effects of bone cement-augmented instrumentation in multilevel lumbar fusions. Cement-augmented screw is one of the techniques used to reduce early mechanical failure in multilevel lumbar fusion, especially in the elderly. However, there is little information regarding the long-term effects.

**Methods:** Fifty patients who underwent more than three levels of lumbar fusion were divided into two groups