To evaluate whether preoperative multirow detector computed tomography (MDCT) findings were associated with clinical outcome 24 months after dynamic stabilization for painful degenerative lumbar spine disease. Preoperative MDCT examinations of 63 patients (66 ± 11.7 years; 60% women) treated with a dynamic screw rod system for painful degenerative segmental instability with/without spinal stenosis were assessed for quantitative and qualitative parameters defining degenerative changes of the thoracolumbar spine, including grades of disc herniation, degenerative spondylolisthesis, vertebral body sclerosis, cross-sectional area of the spinal canal at disc level, intervertebral disc height, ancillary bone mineral density, and anteroposterior diameter of intervertebral foramina. Clinical performance was assessed at baseline and 24 months with quantitative scales, including the Oswestry Disability Index and Short-Form 36 physical component summary. For statistical analysis classification and regression trees, linear regression and nonparametric tests were used. Clinical scores improved substantially over 24 months compared with preoperative values (delta Oswestry Disability Index -32.1 ± 17.2, delta Short-Form 36 physical component summary 4.9 ± 2.3). Physical component summary
improvement was significantly better in patients with lower grades of disc herniation (P < 0.001) and/or spondylolisthesis (P = 0.011), lower cross-sectional area of the spinal canal (P = 0.043), high intervertebral disc height (P = 0.006), and high grades of vertebral body sclerosis (P = 0.002). Patients with high bone mineral density and initially low diameter of intervertebral foramina showed a significantly better improvement of Oswestry Disability Index (P < 0.05). Clinical improvement after dynamic stabilization was significantly associated with 7 independent baseline imaging findings. Preoperative evaluation of these MDCT parameters may improve therapy selection for patients with degenerative lumbar spine disease.