Introduction:
Decompression for lumbar spinal stenosis (LSS) with degenerative spondylolisthesis (DS) has been characterized by degenerative changes with slip progression compared with spinal fusion, which accounts for most negative surgical outcomes. However, how can the minimal damage to the posterior supporting elements cause slip progression and symptom deterioration. The purpose of this study was to answer those questions in a prospective manner.
Methods:
We conducted a 2-year follow-up. The inclusion criteria were: LSS with a slip rate (% slip) ≥10% at L4-5 in the neutral position on a standing radiograph, and microscopic bilateral decompression using a unilateral approach performed at L4-5. Thirty patients with an average age of 71.1± 8.4 years (mean ± SD) were evaluated in this study. Clinical outcomes were determined using the Japanese Orthopedic Association (JOA) 15-point scoring system (where 0 indicated the greatest severity), a VAS for lower back pain (B-VAS: 0–10, where 10 indicated the most severe pain) and leg symptoms (L-VAS: 0–10 for pain and 0–10 for numbness; a score of 20 indicated the greatest symptom severity). The slip rate (% slip) and lumbar lordosis (LL) were calculated through standing lateral radiographs in flexion, neutral position, and extension. The mobility was evaluated based on the absolute difference between the % slip (Δ % slip) measured in the flexion and extension, the range of motion at L4-5, and the difference in LL between flexion and extension. Wilcoxon signed-rank test with a Bonferroni correction was carried out to determine the differences in each parameter across three different time points (before, and 1 and 2 years after surgery). A risk of 5% was considered statistically significant.
Results:
The preoperative JOA, B-VAS, and L-VAS scores were 9.1 ± 1.4, 5.8 ± 3.3, and 13.4 ± 5.0, respectively. The preoperative % slip was 17.1% ± 6.3% at neutral position. The Δ % slip was 2.9% ± 2.3% and ROM was 3.6° ± 2.7°. LL was 44.1° ± 11.6° and L-ROM was 15.2° ± 11.8°. During the follow-up, transient symptom deterioration occurred in 4 patients (juxtafacet cyst at L4-5 in 2 patients and at L5-S in 1, intraforaminal disc herniation (IFDH) at L4/5 in 1). One patient with foraminal stenosis at L5-S required a conservative care even after the follow-up period and one patient required reoperation due to IFDH at L4-5. In 28 patients excluding the 2 patients, radiographic and clinical parameters were evaluated. JOA score and B-VAS improved 1 year after decompression but did not change thereafter. L-VAS improved each year. Any radiographic parameters did not change during the follow-up.
Conclusion:
Minimizing damage to the posterior supporting elements, decompression can lead to satisfactory outcomes without slip progression or secondary instability in LSS with DS. However, degenerative changes at the decompressed and adjacent segments could cause transient symptom deterioration and require salvage surgeries.