Clinical: Posterior dynamic pedicular stabilization

31

Clinical Outcomes of Degenerative Lumbar Spinal Stenosis Treated with Lumbar Decompression and the Cosmic ‘Semi-Rigid’ Posterior System

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Background: Although some believe that the rate of postoperative instability is low after lumbar spinal stenosis surgery, the majority believe that postoperative instability usually develops. Decompression alone and decompression with fusion have been widely used for years in the surgical treatment of lumbar spinal stenosis. Nevertheless, in recent years several biomechanical studies have shown that posterior dynamic transpedicular stabilization provides stabilization that is like the rigid stabilization systems of the spine. Recently, posterior transpedicular dynamic stabilization has been more commonly used as an alternative treatment option (rather than rigid stabilization with fusion), for the treatment of degenerative spines with chronic instability and for the prevention of possible instability after decompression in lumbar spinal stenosis surgery.

Methods: A total of 30 patients with degenerative lumbar spinal stenosis (19 F, 11 M) were included in the study group. The mean age was 67.3 years (40-85). Along with lumbar decompression, a posterior dynamic transpedicular stabilization (dynamic transpedicular screw-rigid rod system) without fusion was performed in all patients. Clinical and radiological results for patients were evaluated during follow-ups in the 3rd, 12th and 24th months postoperative.

Results: The average follow-up period was 42.93 months (24-66). A clinical evaluation of patients revealed that, compared to preoperative assessments, statistically significant improvements were observed in the Oswestry and VAS scores in the last follow-up control. Compared with preoperative values, there were no statistically significant differences in radiological evaluations, such as segmental lordosis angle (α) scores (p=0.125; p>0.05) and intervertebral distance (IVS) scores (p=0.249; p>0.05). There were statistically significant differences between follow-up lumbar lordosis (LL) scores (p=0.048; p<0.05). We observed minor complications, including a subcutaneous wound infection in two cases, a dural tear in two cases, CSF fistulas in one case, a urinary tract infection in one case and urinary retention in one patient. The L5 screw loosening was observed in one of our three-level decompression cases. We did not observe screw breakage or perform revision surgery in any of these cases.

Conclusions: Posterior dynamic stabilization without fusion applied to lumbar decompression leads to better clinical and radiological results in degenerative lumbar spinal stenosis. In order to avoid postoperative instability, especially in elderly patients that experience degenerative lumbar spinal stenosis surgery with chronic instability, the application of decompression with posterior dynamic transpedicular stabilization is likely an important alternative surgical option to fusion as it does not have fusion-related side effects, is easier to perform than fusion, requires a shorter operation time and has low morbidity and complication rates.