Degenerative lumbar spondylolisthesis-induced radicular compression: nonfusion-related decompression in selected patients without hypermobility on flexion-extension radiographs.


Abstract

Object. The authors conducted a study to determine the results of decompressive surgery without fusion in selected patients who presented with radicular compression syndromes caused by degenerative lumbar spondylolisthesis and in whom there was no evidence of hypermobility on flexion-extension radiographs.

Methods. The medical records and radiographs obtained in 49 patients were reviewed retrospectively. Clinical status was quantified by summing self-assessed Prolo Scale scores. All 49 patients (55% female, mean age 68.7 years) presented with leg pain accompanied by lumbalgia in 85.7% of the cases. Preoperatively the median sum of Prolo Scales scores was 4. The mean preoperative degree of forward vertebral displacement was 13.5% and was located at L-4 in 67% of the cases. Osseous decompression alone was performed in 53%, and an additional Discectomy at the level of displacement was undertaken in the remaining patients because of herniated discs. Major complications (deep wound infection) occurred in 2%. During a mean follow-up period of 3.73 years, 10.2% of the patients underwent instrumentation-assisted lumbar fusion when decompression alone failed to resolve symptoms. At last, follow up the median overall Prolo Scale score was 8. Excellent and good results were demonstrated in 73.5% of the patients. Prolonged back pain ($r = 0.381$) as well as the preoperative degree of displacement ($r = 0.81$) and disc space height ($r = 0.424$) influenced outcome ($p = 0.05$); additional Discectomy for simultaneous disc herniations at the displaced level did not influence outcome ($p = 0.05$).

Conclusions. These results appear to support a less invasive approach in this subgroup of elderly patients with degenerative lumbar spondylolisthesis-induced radicular compression syndromes and without radiographically documented hypermobility. Additional Discectomy for simultaneous disc herniations of the spondylolisthetic level did not adversely influence the outcome. Complication rates are minimized and fusion can eventually be performed should decompression alone fail. A prospective controlled study is required to confirm these results.

Permission to reprint requested from the American Association of Neurological Surgery

Editor's Summary and Comments

The authors have produced a study that should be helpful to all spine surgeons. With an increasing number of the elderly staying active but continuing to have spine problems, spine surgeons will meet up with patients with degenerative lumbar spondylolisthesis (DLS) on a regular basis and be faced with what is a reasonable solution for them.

The authors have studied a larger-than-previously reported group of such patients and have followed them for over three years. The original group of 56 patients was reduced to 49 and these had follow up according to the study design. Other similar studies had fewer patients (9 or 25) and were treated similarly. The contention to date is that DLS is an unstable state and associated with chronic back or leg pain and disability. The degree of instability is not considered. The authors have taken their study group and put them through flexion—extension radiographs to determine instability. One criticism of this study is the subjective and non-quantified nature of effort to create such movement and the effect of intercurrent pain and other conditions allowing or preventing a “good effort”. The authors challenge the idea that decompression and fusion produces better clinical outcomes than decompression alone and note the small numbers in previously reported studies. The authors admit that the limited number of
patients, which could skew results, limits their study; no control group, psychosocial variables not included, and follow-up radiographs were not available on all patients.

The study population was typical of what spine surgeons evaluate as well as their symptoms: back pain usually for years, claudication, sciatica, sensory deficit, motor deficit, etc. Their assessments included Prolo Scale scoring pre- and post-operative. The imaging studies included plain films with flexion-extension and CT scans with plain films being the follow-up study. The authors did not include MRI studies that may have been available but not discussed because the numbers would have been smaller. It would have been helpful to see postoperative CT scans to assess the correlation of symptom relief with the alteration of intra-spinal anatomy at a more detailed level than plain films.

The authors noted a lower complication rate for this limited surgery (laminotomy, laminectomy, and/or medial arthrotomy than decompression/fusion surgeries and note that the elderly would be helped by an effective solution with a low failure rate considering their age and other infirmities. Their success rate of 73.5% and increase in overall median Prolo Scale score from 4 to 8 is also notable.

Hypermobility of DLS demonstrated on flexion-extension radiography was not present in these patients. With good results, the authors note that previous studies did not include outcome analysis and hence their reports of 86 – 96% satisfactory results may be in question. These patients, having decompression without fusion, also avoid the post-operative complications of accelerated adjacent degeneration, problems with post-operative immobilization, but may still need fusion later. (approximately 10%).

The authors discuss the reasons for failure of decompression alone including age, indication for surgery, degree of DLS, orientation of facet joints, degenerative status of decompressive technique, eventual progression of postoperative spondylolisthesis, and comorbidities. They note that additional discectomy for disc herniation did not affect outcome on a statistical basis during the 3+ years of follow-up. In addition, this study readily admits to treatment of an adjacent level for stenosis, and this muddies the significance of the conclusion by creating another subgroup.

The database for this study is similar to those available in other clinical settings—10 consecutive years of operative notes, clinical records including symptoms and presentation, and treatment records prior to surgery and after. The operative records revealed an effort by the authors to limit bone resection, ostensibly to avoid creating post-operative instability. Operative notes NOT oriented towards a study may be criticized for their pertinence as the source of “what happened where and to whom”. Since 42% underwent laminectomy, it would be interesting to know which of the decompression-only patients that required fusion were in this group. Of course, other factors in the surgery failure group need to be studied as well.

Overall, the authors are to be congratulated for producing a very good retrospective study of this group of selected patients, and they plan on a prospective study. They have produced a good argument for spine surgeons to consider flexion-extension films for patients with DLS and if NO instability is determined, try decompression and discectomy instead of decompression and instrumented fusion.

Kenneth P Burres MD
Montclair, California