Point of View: Dynamic Stabilization in Addition to Decompression for Lumbar Spinal Stenosis With Degenerative Spondylolisthesis

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When conservative treatment fails, the mainstay of surgical treatment for degenerative spondylolisthesis with spinal stenosis is decompressive laminectomy with stabilization. Decompression primarily relieves leg pain and neurogenic claudication, whereas fusion primarily relieves back pain by elimination of instability. The goals of instrumentation are to promote fusion and correct listhesis or kyphotic deformity.

Most studies show that fusion has a better long-term outcome than decompression alone. Even a pseudarthrosis from uninstrumented fusion may produce a good clinical outcome in short-term (2-year) follow-up. Indications for instrumentation remain controversial. There is evidence that instrumentation improves the fusion rate but does not improve clinical outcome in a relatively short-term follow-up. However, better clinical outcome has been reported in the long-term follow-up (≥5 years), with instrumentation over uninstrumented fusion because of the high incidence of pseudarthrosis in the latter group, in which the outcome deteriorates over time.

Benefit of instrumented fusion comes with a price of higher postoperative morbidity and complication rate. In this background, dynamic stabilization with instrumentation but without fusion raises new hope, expectations, and enthusiasm.

The present article is the first report of a prospective clinical trial with dynamic stabilization for degenerative spondylolisthesis and is an independent clinical evaluation of the Dynesys system (Zimmer Spine, Minneapolis, MN) by a group of surgeons not involved with its development. It is a small series, and statistical significance is questionable. Nevertheless, the results clearly indicate that dynamic stabilization with Dynesys is safe and effective to provide pain relief and prevent progressive listhesis. This is not a comparative study, but clinical efficacy with Dynesys is comparable to that of instrumented fusion in 2-year follow-up, as seen in the literature.

The most important advantage over fusion, with or without instrumentation, is that it avoids the complications and morbidity of harvesting bone graft.

However, it is unfortunate to note that Dynesys neither avoids the complications associated with instrumentation nor prevents adjacent segment degeneration. It also remains uncertain whether the clinical improvement with Dynesys will last in the long-term follow-up. If the improvement deteriorates over time (approximate 5-year follow-up), it may not be superior to the results with an uninstrumented fusion. Screw loosening is commonly seen in rigid fixation when fusion fails to occur, and it results from continued micromotion. In dynamic stabilization, screw loosening is unexpected despite continued motion because the device should be able to accommodate such motion, without stressing the screw-bone junction. In this study, the incidence of screw loosening with Dynesys (17%) was comparable to rigid instrumentation for fusion. This rate raises questions about restoration of the normal kinematic property of a motion segment with Dynesys stabilization. Dynamic stabilization is a new tool, and only prospective clinical studies like this will help perfection of its proper use, indications, and technique in the treatment of degenerative spondylolisthesis.

References