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Dynamic Stabilization of the Lumbar Spine with Isobar®
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Introduction: The occurrence of symptomatic adjacent segment disc degeneration (SASD) has paralleled the use of rigid instrumentation placed to facilitate spinal arthrodesis. It is thought that the rigid metal implants place supra-physiological strain on the neighboring intervertebral disc space and facet joints, thus leading to segmental hypermobility, facet deterioration, instability, and ultimately advanced segmental degeneration in a domino-type effect. The occurrence rate of adjacent segment degeneration (ASD) has been reported by numerous authors and ranges up to 82.6%. Dynamic stabilization aims to reduce the strain placed on adjacent levels through semi-rigid implants. The Isobar, by Scientx Corporation, is a pedicle screw based system that utilizes a dynamic rod. The device can be used to provide dynamic support to a single spinal level, or it can be used to top off a rigid fusion. We describe our experience with 76 consecutive patients undergoing dynamic stabilization procedures at a single institution by senior author, DQM.

Methods: Seventy-six consecutive patients undergoing dynamic stabilization procedures at a single institution are presented. Radiographic follow-up and outcome measures with the Oswestry Disability Index, and SF-36 were gathered.

Results: Patient follow-up ranges from 4-50 months. A total of 36 patients had completed an Oswestry Disability Index at the time of their last follow-up (range 6-43 months). Excellent outcomes were conferred in 51.7% of patients, while 20% had a good outcome, 20% had a fair outcome, and only 8.6% had a poor outcome. There was no evidence pedicle screw failure on radiographic follow-up, and in only one case there was a hardware failure that consisted of a set-screw backing out. This, however, was asymptomatic and did not require further intervention.

Conclusion: In our experience with seventy-six patients, we have found the Isobar dynamic stabilization system to be a safe and effective means of offering patients a spinal stabilization procedure while mitigating the incidence of symptomatic adjacent level degeneration. It is clear that further longitudinal evaluation will be required to determine the long-term benefit of this device. In addition, a randomized, prospective study comparing similar cohorts undergoing stabilization with Isobar dynamic rod or rigid fusion would be useful in determining the Isobar’s effectiveness in preventing SASD.