Spinal cord stimulation in non-operated spinal stenosis compared to persistent pain after spine surgery: a prospective analysis of 199 cases

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Introduction

Surgical treatment of degenerative spinal stenosis has shown mixed results in a large RCT comparing it to physical therapy alone, with no significant differences in terms of pain and Oswestry Disability Index (ODI) in long-term follow-up (Delitto, 2015). When surgery is performed, simple laminectomy may lead to comparable outcomes as compared to fusion, but still carries a 4-year reoperation risk of 21% (Försth, 2016). In both studies, reported decreases in ODI scores were around 50%.

Spinal cord stimulation (SCS) is a possible alternative. We present a prospective case series of patients undergoing SCS for non-operated spinal stenosis, compared to a "reference" population of patients with so-called failed back surgery syndrome (FBSS).

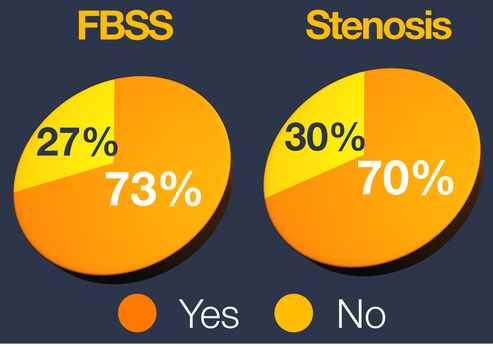
Methods

Over a period of 7 years, we collected data on patients undergoing permanent SCS at the T8–T9 level. A single electrode was planned unless symmetric stimulation could not be obtained during intraoperative testing. Tonic stimulation was used in all cases.

Single percutaneous octopolar leads were chosen in all but 10 cases who were treated with percutaneous paddle leads (Lamitrode, St. Jude Medical, Sain Paul, MN, USA).

We recorded complications, pain intensity (NRS) and ODI values up to 48 months. Between-group differences were analyzed with ANOVA for repeated measures.

Proportion of patients attaining ≥10-point reduction in ODI at 12 m



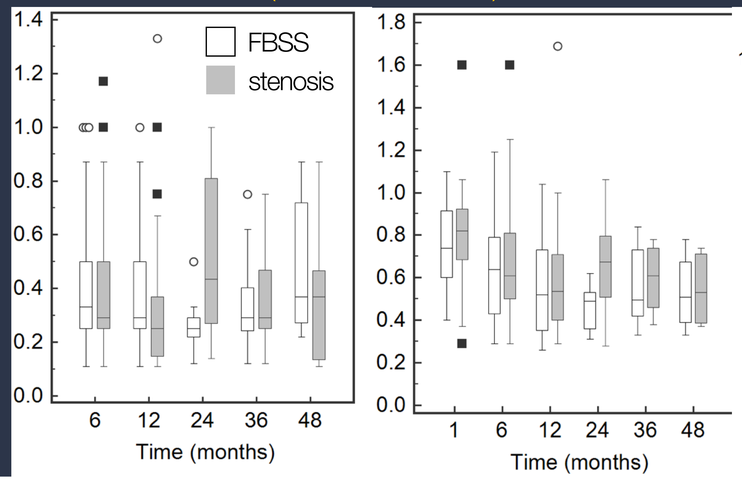
Results

We collected data on 97 patients with stenosis and 102 patients with FBSS. Median age at implant was 72 (range: 33 – 90) years. In both groups, median NRS reductions were ≥50% from 6 to 48 months after implant (figs. 1 and 2), with no significant between-group differences (p≥0.28). Over 48 months, 25 (12.6%) systems were explanted for complications or patients' requests; there were 21 (10.6%) lead and 1 (0.5%) pocket revisions. Median (95% confidence interval) life of primary cells was 42 (39–53) months.

Conclusion

Spinal cord stimulation is an effective alternative for patients who prefer not to undergo surgery for spinal stenosis. Our data contribute to the hypothesis that a SCS trial may be a less-invasive option before open surgery, especially in older patients. SCS significantly improved disability, in addition to pain intensity.

Time course of NRS and ODI scores (ratio over baseline)



Revision-free implant survival (%)