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Positioning of the lead and location of the implantable pulse generator pocket for spinal cord stimulator may impact the likelihood of subsequent surgical revisions

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Keywords

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Abstract

INTRODUCTION:

Spinal cord stimulation (SCS) represents a potential treatment for patients with refractory back pain. However, SCS is not without limitations. While characteristics and predictors of SCS implantation success are well described, the fate of patients who require revision surgery after initial implantation remains poorly understood. We sought to characterize the fate of SCS patients that require surgical revision and identify pertinent patient features that may indicate greater likelihood of revision success.

METHODS:

We performed a single-center retrospective review of all patients who had SCS revision surgery performed from 2008-2022 at OHSU. Pertinent demographic, clinical, and operative data was extracted from the EHR. Patients were stratified by whether their SCS therapy was rescued after single or multiple revision surgeries. Continuous and categorical variables were compared with independent t-tests and chi-squared testing, respectively. All tests were two-tailed and significance was set at $\alpha = 0.05$.

RESULTS:

A total of 53 patients were included. The average age of initial revision was 54.4 +/- 17 years. 49.1% and 50.9% of patients were male and female, respectively. 39.6% of patients underwent multiple revisions. The most common indication was lead migration, accounting for 66% of cases. Patients requiring multiple revisions did not significantly differ from those requiring a single revision with respect to baseline demographic and clinical variables. However, lower back implantable pulse generator (IPG) placement was associated with a lower likelihood of multiple revision, trending towards significance ($p=0.10$). Further, cervical lead positioning trended towards increased likelihood of multiple revisions ($p=0.069$).

CONCLUSIONS:

SCS holds therapeutic promise for individuals with refractory back pain. It is important to ascertain what factors may predispose someone to multiple procedures and potential treatment failure. These data tentatively suggest that lower back IPG implantation may decrease the need for multiple revisions. Conversely, cervical leads may increase the need for several revision procedures.