Bone Growth Stimulator Devices Reduce Surgical Intervention, Opioid Utilization, and Overall Costs in Patients With Fracture Nonunions

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Purpose: Approximately 10% of all fractures result in delayed union or nonunion. In these cases, patients experience prolonged pain and disability as well as increased utilization of health-care resources such as pain medication, physical therapy, and subsequent surgery. Osteogenesis stimulator devices are a safe and low cost non-invasive option to aid healing in nonunion cases. This study evaluated the real-world impact of device usage on a variety of health-care utilization end points by retrospectively analyzing a large claims-based database.

Methods: The database was queried for adults with nonunion diagnosis, with evidence of a prior fracture in the previous 180 days (n = 11,010). The stimulation group (n = 1628) was defined as those patients having at least 1 claim for a stimulator 90 to 180 days following fracture and up to 60 days following the nonunion diagnosis. The control group (n = 9382) had a nonunion diagnosis with evidence of a fracture in the prior 180 days, but did not receive a device. In this study, the nonunion diagnosis was considered the index event. All patients were required to have 12 months of continuous enrollment in the database prior to index, and 24 months enrollment following index. Baseline patient demographics and clinical characteristics between the 2 groups were compared, along with post-index health-care resource utilization and costs.

Results: Device patients had lower rates of surgical intervention for their nonunion compared to control (214/1628, 13.1% vs 1751/9382, 18.7%; P<0.001). Device patients had lower rates of opioid utilization post-index compared to control (948/1628, 58.2% vs 6359/9382, 67.8%; P<0.001), despite having higher use prior to nonunion diagnosis. Device patients were less likely to have an inpatient admission (189/1628, 11.6% vs 2105/9382, 22.4%; P<0.001) and had lower outpatient rehabilitation/physical therapy utilization post-index (361/1628, 22.2% vs 2532/9382, 27.0%; P<0.001). Overall health-care costs among stimulation patients were significantly lower in year 1 post-index ($21,654 vs $29,101, P<0.001). In the 2-year period following the nonunion diagnosis, stimulation patients averaged $9240 less in health-care costs.

Conclusion: The results show that bone growth stimulator devices have a positive individual and societal impact on treating patients with fracture nonunions. Despite these myriad benefits, use of stimulation remains an underutilized resource. In the current study, these devices were only utilized in approximately 15% of eligible cases. Further work is needed to expand awareness of this useful tool for treating nonunions.