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General

Improved Pain and Function Using Multiphase Spinal Cord Stimulation in a Nonsurgical Spine Patient

Jamal Hasoon[1], Ivan Urits[2], Omar Viswanath[3]

[1] Department of Anesthesiology, Critical Care, and Pain Medicine, The University of Texas Health Science Center at Houston, [2] Department of Pain Management, Southcoast Health, [3] Creighton University School of Medicine

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Background

Chronic low back pain due to degenerative disc disease (DDD) and lumbar spondylosis is a leading cause of disability. Many patients exhaust conservative and interventional treatments yet remain poor surgical candidates. Spinal cord stimulation may be an effective therapy for many of these patients.

Case Presentation

A 65-year-old female with lumbar DDD and lumbar spondylosis presented with chronic low back pain refractory to conservative therapy. She previously failed acetaminophen, NSAIDs, gabapentinoids, muscle relaxants, and opioids, as well as multiple interventional procedures including epidural steroid injections, medial branch blocks, radiofrequency ablation, and sacroiliac joint injections. The patient underwent an SCS trial using the Biotronik Prospera system with multiphase stimulation, achieving approximately 60% pain relief and marked functional improvement. She subsequently received a permanent SCS implant, reporting >90% sustained pain reduction. She was able to discontinue opioid therapy entirely. At >9-month follow-up, she continued to experience durable benefit, had lost more than 35 pounds, increased physical activity, and returned to independent function.

Conclusion

This case highlights the effectiveness of SCS as a treatment option for chronic nonsurgical back pain, demonstrating not only substantial pain reduction but also improved function, weight loss, medication reduction, and overall quality of life. Multiphase stimulation with the Biotronik Prospera system may provide an effective alternative for patients who do not respond to comprehensive conservative care.

INTRODUCTION

Chronic low back pain is one of the most prevalent and disabling conditions worldwide. Patients with lumbar degenerative disc disease (DDD) and spondylosis often fail conservative management and may not qualify for or desire surgery. Spinal cord stimulation (SCS) is a commonly accepted treatment options for patients suffering from chronic low back and leg pain following spinal surgery.[1-7] However, SCS has also become an important therapeutic option for patients with non-surgical back pain, offering meaningful pain relief and functional improvement.[8-11] This report describes a patient with long-standing nonsurgical low back pain who achieved profound and sustained improvement with SCS using the Biotronik Prospera multiphase stimulation system [BIOTRONIK Inc, Oregon USA].

CASE DESCRIPTION

A 65-year-old female with a longstanding history of chronic low back pain secondary to lumbar degenerative disc disease and lumbar spondylosis presented with persistent, debilitating symptoms despite extensive conservative and interventional management. Her pain was axial in nature with intermittent radicular features and had significantly limited her mobility, activity tolerance, and quality of life. Prior treatments included acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), multiple courses of gabapentin, muscle relaxants, and opioid therapy, all of which provided insufficient or short-lived relief. Interventional procedures—including epidural steroid injections, lumbar medial branch blocks, radiofrequency ablation, and sacroiliac joint injections—also failed to yield meaningful or sustained improvement. Given the refractory nature of her symptoms and nonsurgical status after spine evalua-

tion, she underwent a spinal cord stimulation trial using the Biotronik multiphase SCS system with leads placed at the T7/T8 levels. During the trial, she experienced approximately 60% reduction in pain with notable improvement in function and activity tolerance. Based on this response, she proceeded with permanent implantation. At follow-up after implantation, she reported >90% improvement in pain, complete discontinuation of opioid therapy, and substantial gains in daily functioning. Over the next nine months, she demonstrated sustained benefit, increased physical activity, and intentional weight loss exceeding 35 pounds. She remained off all pain medications and continued to report excellent pain control and enhanced quality of life.

DISCUSSION

This case highlights the growing role of spinal cord stimulation (SCS) as an effective therapy for patients with chronic nonsurgical low back pain who have exhausted conservative and interventional options.[8-11] Traditionally, SCS has been used mainly for post-laminectomy syndrome and neuropathic radicular pain; however, newer studies support its use in patients with degenerative spine pathology who are not surgical candidates and who continue to experience substantial functional impairment. In this patient, years of multimodal medical therapy including acetaminophen, NSAIDs, gabapentinoids, muscle relaxants, and opioids failed to provide meaningful improvement. Likewise, multiple fluoroscopically guided interventional pain procedures, including epidural steroid injections, facet interventions, radiofrequency ablation, and sacroiliac joint injections, did not produce lasting benefit. Her clinical course reflects a population commonly encountered in modern pain practice.

The strong response observed during the SCS trial, achieving approximately 60% pain reduction, was consistent with predictors of long-term success. Notably, following permanent implantation using the Biotronik multiphase SCS system, the patient demonstrated dramatic and durable improvement with more than 90% ongoing pain relief. Her sustained functional gains, discontinuation of opioid therapy, and ability to increase physical activity leading to significant weight loss (>35 pounds) underscore the broader impact neuromodulation can have beyond pain reduction alone. Improvements in mobility, sleep, mood, and daily engagement often accompany effective SCS therapy and likely contribute to durable benefit.

Despite these promising results, clinicians must remain mindful that SCS is not without risks, including lead migration, infection, and device-related complications.[12-15] Careful patient selection, counseling, and follow-up remain essential to optimizing outcomes. This case adds to the growing body of literature demonstrating that SCS can be a valuable option for patients with refractory nonsurgical back pain, particularly when functional restoration and opioid minimization are major treatment goals.

CONCLUSION

This case demonstrates the significant and sustained clinical benefit that spinal cord stimulation can provide for patients with chronic nonsurgical low back pain who have not responded to conservative or interventional management. After exhausting multiple treatments without meaningful improvement, the patient experienced robust pain relief during the SCS trial and even greater, durable relief following permanent implantation with a multiphase stimulation system. Her improvements extended beyond pain reduction, resulting in increased mobility, discontinuation of opioid therapy, substantial weight loss, and enhanced overall function. This case highlights the expanding role of SCS as a viable treatment option for appropriately selected patients with degenerative spine-related pain and underscores the importance of considering neuromodulation when traditional therapies fail.

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