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Spinal Cord Stimulation Therapy for Failed Back Surgery Syndrome in a Patient with Mild Dementia Case Report

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Background: Failed back surgery syndrome (FBSS) continues to become more prevalent as surgical interventions for patients with chronic low back pain increase. Neuromodulation with spinal cord stimulation (SCS) is proven to benefit FBSS. A relative contraindication to SCS therapy is dementia.

Case Report: An 81-year-old Hispanic woman with a medical history of dementia and persistent chronic low back pain despite L2-S1 lumbar fusion presented to an outpatient pain clinic with severe low back pain. The patient underwent a SCS trial and followed up with the clinic showing improvement of pain and ability to sit for longer periods of time and sleep longer. After 4 days, the patient underwent implantation of a recharge-free SCS using standard procedure and reported 80% to 90% improvement of pain, decreased dosing of opioid medication, and decrease in blood pressure.

Conclusion: We successfully implanted a SCS in a patient with dementia and chronic low back pain from FBSS.

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Key words: Case report, dementia, spinal cord stimulator

BACKGROUND

Lifetime low back pain prevalence ranges from 51% to 84%, and more patients are undergoing spinal surgery in an attempt to alleviate this pain (1). Failure rates for spinal surgery have been reported to be between 10% to 40% (2). As patients with chronic low back pain continue to undergo surgical intervention in search of pain relief, the number of patients with persistent low back pain despite intervention, known as failed back surgery syndrome (FBSS), also continues to rise (3). In patients suffering from FBSS, providing pain relief and enhancing quality of life can become a difficult task for the pain physician. Many disciplines are challenged with the multimodal treatment approach of FBSS. Neuromodulation with spinal cord stimulation (SCS) has been established as a safe and effective therapy for a multitude of chronic pain conditions, specifically for the treatment of FBSS (4). Although SCS has been well established as a safe approach to treating chronic pain in FBSS, a relative contraindication for implementation exists in patients with cognitive impairments, including dementia (5). Our case highlights the fact that patients with mild dementia should not be disqualified from SCS therapy in the treatment of chronic back pain associated with FBSS if proper screening measures are undertaken and/or good family support is present. In

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addition, objective data can be gathered to help assess the response to SCS therapy. Breakthroughs in automation and self-sustaining features in SCS devices allow patients to simply set the device and allow the physician to take care of managing device settings. Furthermore, patients suffering from cognitive impairment in the case of dementia do not have to worry about the device battery life and recharging with the new recharge-free systems. We present a case that demonstrates the successful use of SCS therapy in a patient with mild age-related dementia suffering from low back pain associated with FBSS.

CASE

An 81-year-old woman with a past medical history of mild age-related dementia and chronic low back pain resulting in lumbar fusion at levels L2-S1 presented to an outpatient pain clinic with persisting low back pain. Analgesic control with high-dose oxycodone failed to offer much pain control. Due to the patient's persistent pain despite multilevel spinal surgery and oral medications, a diagnosis of FBSS was made. Attempts at multiple pain control modalities, including epidural steroid injections, facet joint injections, and radiofrequency ablations failed to provide adequate analgesia for the patient. The patient and her daughter were concerned about undergoing further surgery, and after a psychosocial and medical review, the patient was offered a SCS trial. The SCS trial was carried out in an outpatient clinic using sterile technique with local anesthesia and fluoroscopic guidance. The trail lead procedure was identical to the permanent lead procedure discussed below. Two percutaneous epidural leads were inserted with an external stimulator device for trialing. The leads were positioned at the T8-T9 vertebral levels after intraoperative external impulse generator stimulation confirmed the patient's desired location. The trial lead stimulation parameters were set to burst stimulation at an amplitude of 0.6 mA, a frequency of 200 Hz, and a pulse width of 1000 μs. During the trial, the patient reported meaningful and clinical improvement in pain symptoms; she was able to walk farther, sit for longer periods of time, and sleep longer than prior to the trial lead placement. The patient's daughter monitored heart rate and blood pressure daily, and after reviewing her blood pressure log, a notable 10% overall blood pressure reduction was identified compared with readings from before the trial. The SCS trial leads were removed after 4 days, and the patient underwent implantation of a recharge-free system spinal cord stimulator (SCS).

The permanent SCS implantation occurred at an ambulatory surgery center using monitored anesthesia care. Aseptic precautions in full surgical attire with sterile technique were conducted. The patient was placed in the prone position during the entire procedure for impulse generator placement in the lateral aspect of the buttock. Using a radiolucent table, a true anteroposterior view of the thoracolumbar was established with the C-arm positioned directly over the patient. A 2-lead SCS was performed as follows. The L1/L2 interspace was identified using fluoroscopy. Once the interspace was identified, a 5-cm cephalad-to-caudad incision was created over this region and blunt dissection was used to visualize the paraspinous fascia. The first SCS manufacturer's needle was inserted 1.5 cm lateral to the left of the spinous process and 0.5 cm inferior to the interspace at a 35- to 45-degree angle to the epidural space, confirming entry into the epidural space using the loss-of-resistance technique. The second SCS manufacturer's needle was inserted 1.5 cm lateral to the right of the spinous process and 0.5 cm inferior to the interspace at a 35- to 45-degree angle to the epidural space, again confirming entry into the epidural space using the loss-of-resistance technique. The 2 epidural catheters were then threaded through each needle into the dorsal epidural space, directing them with gentle rotation of the electrode to either side of midline using fluoroscopic guidance. Both electrodes were positioned in the T8-T9 vertebral levels, with lead placement shown in Fig. 1, and the pattern of stimulation was carried out using the impulse generator and confirmed by the patient identifying where she felt the impulses. After the leads were secured with the manufacturer's anchoring device, an 8-cm transverse incision was created in the right lateral aspect of the buttock just above the iliac crest for the recharge-free impulse generator to be inserted, and the free ends of the 2 electrode catheters were tunneled through the subcutaneous tissue using a tunneling device to connect to the impulse generator. The excess leads were coiled and placed in the pocket with the impulse generator. Both incisions, the paraspinous fascia region and the incision created for the impulse generator pocket, were closed using a 2-layer closure with subcutaneous followed by skin sutures. Suture glue was then administered over the closed incision sites and standard dressings were applied.

The final stimulation parameters were identical to the trial leads, using burst stimulation at an amplitude of 0.6 mA, a frequency of 200 Hz, and a pulse width of 1000 μs. At the follow-up appointment post permanent SCS implantation, the patient reported an overall reduction in her low back pain by 80% to 90%, as well as tremendous improvements in quality of life. Specifically, she reported an improved ability to ambulate about her home, an improved quality of sleep, and a decrease in her oxycodone dose by half.

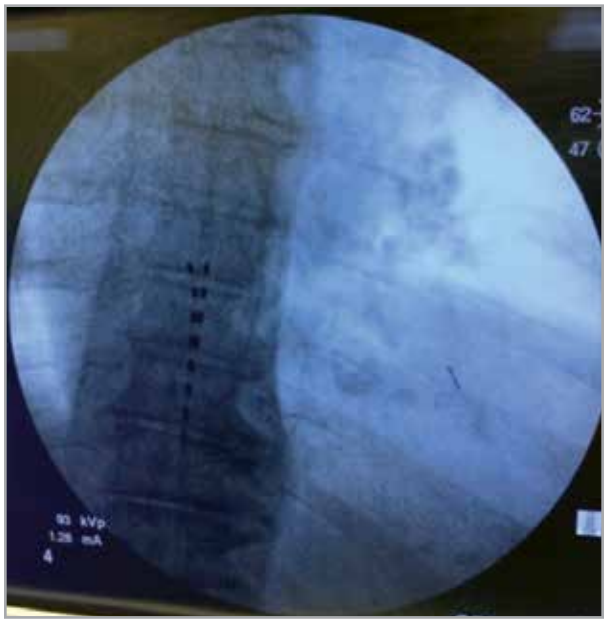

Fig. I. SCS lead placement

DISCUSSION

Randomized controlled trials comparing SCS vs repeated spinal surgery in patients with FBSS support superior analgesic control with SCS therapy (6). Neuromodulation in the form of SCS is implanted in approximately 50,000 patients annually to treat chronic pain secondary to neuropathy and radiculopathy (7). When identifying the appropriate patients to utilize this treatment approach, although controversial, a comprehensive psychosocial and medical review should be performed on each patient. Screening for somatoform disorders, personality disorders, or hypochondriasis might be beneficial in assessing future analgesic efficacy with SCS in these patients, according to researchers (6). Parisod et al (8) published a report supporting the importance of psychological assessment and screening, in which a patient who underwent SCS for the treatment of chronic pain developed conversion disorder, which was thought to be due to an underlying personality disorder that had been unrecognized and undiagnosed due to the lack of pre-psychological screening. Among psychological disorders, a relatively difficult candidate to assess is the patient with an acquired neurocognitive impairment such as dementia. Dementia affects one in every 10 patients over the age of 65 and more than 50% of patients over the age of 85 in the United States (9,10). Although assessing subjective pain levels in these patients can be difficult, most patients with dementia can report pain reliably, and the gold standard for quantifying and qualifying this pain continues to be the patient's self-report (9).

In addition to the patient self-reporting severity and quality of the pain, objective metrics can be employed to help assess response to therapy, such as reduction in sympathetic stimulation from chronic pain affecting blood pressure and heart rate. Furthermore, caregivers are able to provide valuable insight into the patient's improved state after SCS trial leads are placed. Given the fact that patients with dementia are at further risk of cognitive decline when consuming opioids, alternative therapies should be considered, such as fluoroscopy-guided spinal injections and radiofrequency ablation procedures. If these treatment modalities do not offer clinical improvement in functional outcomes for the patient, then SCS should be considered, offering a safer non-opioid and nonsurgical adjunct for the elderly patient with dementia and chronic pain. Moreover, innovative changes to SCS technology such as recharge-free and wireless adjustable stimulation settings further tailor to dementia patients, making pain relief devices easy to understand and operate. Once an SCS device is implanted, a patient can now have the benefit of a recharge-free system, giving a patient freedom from routine appointments to charge the implanted device. In addition, physicians are able to monitor and adjust device status and settings electronically from the office without burdening the patient with multiple office visits. Given these facts, patients with mild dementia should be considered for SCS therapy as an adjunct or even alternative to more invasive and potentially debilitating surgical and pharmacological therapies for the treatment of chronic low back pain, especially secondary to FBSS.

CONCLUSION

We successfully implanted a SCS in a patient with mild dementia and FBSS with improvement in low back pain. Dementia is an acquired neurocognitive disorder that poses a relative contraindication to implantable SCS devices due to the difficulty quantifying and qualifying the patient's pain. However, literature supports the gold standard of determining the patient's pain to be both self-report and caregiver feedback in the evaluation of pain for this patient population. This case highlights the importance of individualized psychological and medical screening and selection when discussing low back pain treatment modalities with patients who suffer from dementia. Given our successful case, patients with mild dementia should be considered for SCS therapy over conventional medical management in the treatment of chronic pain associated with FBSS. Patients with mild dementia should not be disqualified from SCS therapy in the treatment of chronic low back pain.

Author Contributions

OD: Writing
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