

PENILE PAIN WITH ALLODYNIA FOLLOWING SPINAL CORD STIMULATION (SCS) IMPLANT: A CASE REPORT

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Background: Spinal cord stimulation (SCS) is commonly utilized for managing chronic intractable pain associated with spinal conditions, complex regional pain syndrome (CRPS), neuropathic pain, and peripheral neuropathy. Although rare, complications such as dermatologic reactions and lead-related allergies have been reported. However, penile pain with allodynia has not been previously documented. We present a unique case of penile pain with allodynia following successful SCS implantation and initial pain relief.

Case Report: A 53-year-old man underwent implantation of a Boston Scientific spinal cord stimulator with leads positioned at the T8 level, covering the T9-T10 interspace. This followed a successful trial that resulted in 70% pain relief and functional improvement for chronic low back and lower extremity pain due to post-laminectomy syndrome. Following the permanent implant, the patient experienced approximately 40% relief over two months. Subsequently, the stimulator stopped providing effective relief, and he reported ongoing low back pain along with the new onset of penile pain. Despite multiple reprogramming attempts, he developed significant anxiety over his symptoms. Dermatological and urological evaluations were unremarkable. Pharmacologic interventions, including Gabapentin, followed by Pregabalin, opioids, and THC, were ineffective. The penile pain persisted regardless of whether the stimulator was active. After comprehensive discussions and shared decision-making, the stimulator was explanted. Post-surgery, the patient recovered well, and his penile discomfort resolved immediately.

Conclusion: SCS can potentially lead to rare complications such as penile discomfort. In such cases, explantation of the device may be the only effective resolution.

Key words: Spinal cord stimulation (SCS), side effects, penile pain, explantation of stimulator

BACKGROUND

Spinal cord stimulation (SCS) has been employed since 1967 to manage various chronic pain conditions that are unresponsive to conservative treatments, interventional procedures, and surgical interventions (1-9). Its mechanism is fundamentally based on the gate control theory of pain proposed by Melzack and Wall. According to this theory, electrical stimulation of large-diameter A-beta fibers can suppress nocicep-

tive input transmitted by smaller A-delta and C fibers (10). In SCS, leads are placed in the epidural space to deliver targeted electrical impulses, modulating pain perception through complex spinal and supraspinal mechanisms (11). Although the precise mechanisms and specific neural targets of SCS remain under active investigation, the therapy has demonstrated safety and efficacy across multiple indications, including pelvic pain that may involve penile discomfort (12,13).

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Despite a general decline in the use of various interventional pain techniques, SCS continues to show a trend of increased utilization and associated costs (14-17).

The effectiveness of SCS has been well-documented, along with potential complications and device-related issues (18-23). Commonly reported complications include suboptimal pain relief, lead migration, and battery failure. However, to date, chronic penile pain as a complication of SCS has not been previously described in the literature.

We present a rare case of penile pain with allodynia that emerged following SCS implantation. The condition was unresponsive to multiple medical treatments, and no alternative etiology was identified. The patient experienced immediate symptom resolution following explantation of the device.

Written informed consent was obtained from the patient for the presentation of this case report.

CASE REPORT

A 53-year-old man with a history of chronic low back and lower extremity pain secondary to post-lumbar laminectomy syndrome, including lumbar fusion and sacroiliac joint fusion, presented for further evaluation. He had previously undergone a wide range of treatments, including chiropractic care, physician-directed physical therapy, pharmacologic therapy with opioids, muscle relaxants, antiepileptic drugs (AEDs), structured exercise programs, and transforaminal epidural steroid injections, all without long-term relief. After exhausting all conservative treatment modalities and meeting appropriate clinical criteria, he proceeded with SCS evaluation.

A trial stimulation was performed with two leads positioned over the T8 level, covering the T9-T10 disc space. The patient reported over 70% pain relief and marked functional improvement during the trial period. Based on this positive response, a permanent SCS system (Boston Scientific) with leads at the same level and a rechargeable battery was implanted percutaneously without complications.

His postoperative recovery was unremarkable. However, in contrast to the trial results, he reported only 40% pain relief with the permanent device. Over the subsequent two months, despite multiple reprogramming attempts, the stimulator gradually lost efficacy. Simultaneously, he began to experience new-onset penile pain with allodynia, which was not present prior to the implantation.

The patient also developed associated symptoms, including significant sexual dysfunction, extremely painful intercourse, and premature ejaculation. He noted erythema in the penile region radiating toward the pelvis. Pharmacologic management—including Gabapentin, followed by Pregabalin, opioids, and THC—was ineffective.

He underwent evaluation by both urology and dermatology, which failed to reveal any alternative diagnosis or etiology. Notably, the penile pain persisted whether the stimulator was turned on or off. Extended periods with the device turned off resulted in only minor improvement, which worsened upon reactivation.

Given the persistent and distressing symptoms, a shared decision was made to explant the device one year after implantation. The procedure was completed without incident.

Following explantation, the patient reported near-complete resolution of his penile pain and allodynia. His chronic low back and lower extremity pain persisted but was subsequently managed through medical therapy.

DISCUSSION

We report a rare case of penile pain with allodynia following SCS implantation. After exhausting multiple treatment options and ruling out dermatologic and neurologic causes, the patient underwent device explantation, which resulted in immediate and complete relief of the penile pain.

The literature extensively documents various complications associated with SCS, with the most common being a gradual loss of therapeutic effect due to multiple contributing factors. However, reports of pelvic or penile pain as a complication are absent. Interestingly, SCS has previously been utilized for the treatment of pelvic and penile pain.

Chronic urogenital pain poses significant diagnostic and management challenges due to the wide variability in symptom presentation (24,25). Identifying a definitive visceral source for penile pain is often difficult, given the possibility of referred pain. Although penile pain is a recognized subtype of pelvic pain syndrome, it remains underreported in the literature despite its profound impact on sexual function and psychological well-being (26-28). A range of pharmacologic and surgical interventions has been attempted for such cases, often without sustained benefit (29,30), including several approaches trialed in this patient. SCS has been recommended in

the literature as a therapeutic option for managing this type of pain (12,13,24).

In a case described by Huang et al (24), the patient experienced chronic penile pain in association with overactive bladder, mild obstructive sleep apnea, hypothroidism, anxiety, depression, insomnia, and a learning disability. The pain in that case was characterized as a pressure-like sensation accompanied by urinary urgency and frequency. In contrast, our patient described his penile pain as superficial, sharp, shooting, burning, and electric-like in nature, accompanied by allodynia.

Although the patient experienced significant relief during the trial stimulation phase, the results with the permanent implant were only marginal. He had no significant psychological disorders, and his pre-implant psychological evaluation was deemed suitable for SCS therapy. Mild anxiety noted prior to implantation escalated after the onset of penile pain following the procedure.

CONCLUSION

This case report underscores a rare complication of penile pain associated with SCS, which resolved completely following device explantation.

Author Contributions

The article was designed by LM and MRS.

All authors contributed to the preparation of this article, reviewed and approved the content with the final version.

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REFERENCES

1. Shealy CN, Mortimer JT, Reswick JB. Electrical inhibition of pain by stimulation of the dorsal columns: Preliminary clinical report. *Anesth Analg* 1967; 46:489-491.
2. Labaran L, Jain N, Puvanesarajah V, Jain A, Buchholz AL, Hassanzadeh H. A retrospective database review of the indications, complications, and incidence of subsequent spine surgery in 12,297 spinal cord stimulator patients. *Neuromodulation* 2020; 23:634-638.
3. Mattie R, Lin AB, Bhandal H, et al. Spinal cord stimulation for the treatment of complex regional pain syndrome: A systematic review of randomized controlled trials. *Interv Pain Med* 2024; 3:100527.
4. Vu TN, Khunsriraksakul C, Vorobeychik Y, et al. Association of spinal cord stimulator implantation with persistent opioid use in patients with postlaminectomy syndrome. *JAMA Netw Open* 2022; 5:e2145876.
5. Patel CB, Patel AA, Diwan S. The role of neuromodulation in chronic pelvic pain: A review article. *Pain Physician* 2022; 25:E531-E542.
6. Andrade MF, Fabris-Moraes W, Pacheco-Barrios K, Fregni F. Effect of neurostimulation on chronic pancreatic pain: A systematic review. *Neuromodulation* 2024; 27:1255-1265.
7. Hofmeister M, Memedovich A, Brown S, et al. Effectiveness of neurostimulation technologies for the management of chronic pain: A systematic review. *Neuromodulation* 2020; 23:150-157.
8. Huygen FJPM, Soulanis K, Rtveladze K, Kamra S, Schlueter M. Spinal cord stimulation vs medical management for chronic back and leg pain: A systematic review and network meta-analysis. *JAMA Netw Open* 2024; 7:e2444608.
9. O'Connell NE, Ferraro MC, Gibson W, et al. Implanted spinal neuromodulation interventions for chronic pain in adults. *Cochrane Database Syst Rev* 2021; 12:CD013756.
10. Melzack R, Wall PD. Pain mechanisms: A new theory. *Science* 1965; 150:971-979.
11. Heijmans L, Joosten EA. Mechanisms and mode of action of spinal cord stimulation in chronic neuropathic pain. *Postgrad Med* 2020; 132:17-21.
12. Hao D, Yurter A, Chu R, et al. Neuromodulation for management of chronic pelvic pain: A comprehensive review. *Pain Ther* 2022; 11:1137-1177.
13. Patel CB, Patel AA, Diwan S. The role of neuromodulation in chronic pelvic pain: A review article. *Pain Physician* 2022; 25:E531-E542.
14. Manchikanti L, Sanapati MR, Pampati V, et al. A 24% decline in the utilization of epidural procedure visits for chronic spinal pain management in the Medicare population from 2019 to 2022: Updated analysis of the effect of multiple factors. *Pain Physician* 2024; 27:E983-E994.
15. Manchikanti L, Abd-Elseyed A, Kaye AD, et al. Escalating growth to rapid decline of utilization patterns of facet joint interventions in managing spinal pain in the Medicare population: Updated analysis of the effect of multiple factors from 2000 to 2022. *Pain Physician* 2024; 27:E979-E982.
16. Manchikanti L, Pampati V, Sanapati MR, et al. Exponential decline of 28.9% in utilization of interventional pain management techniques among Medicare beneficiaries from 2019 to 2022: Updated analysis on the ongoing effects of COVID-19, economic decline, the Affordable Care Act (ACA), and medical policies. *Pain Physician* 2024; 27:455-467.

17. Manchikanti L, Pampati V, Vangala BP, et al. Spinal cord stimulation trends of utilization and expenditures in fee-for-service (FFS) Medicare population from 2009 to 2018. *Pain Physician* 2021; 24:293-308.
18. Bendel MA, O'Brien T, Hoelzer BC, et al. Spinal cord stimulator related infections: Findings from a multicenter retrospective analysis of 2737 implants. *Neuromodulation* 2017; 20:553-557.
19. Ho JS, Glicksman M, Kang K, et al. Spinal cord stimulator complication rates: A single-institution, 22-year study (1999-2021). *Pain Physician* 2024; 27:E909-E917.
20. Jones CMP, Shaheed CA, Ferreira G, et al. Spinal cord stimulators: An analysis of the adverse events reported to the Australian Therapeutic Goods Administration. *J Patient Saf* 2022; 18:507-511.
21. Labaran L, Jain N, Puvanesarajah V, Jain A, Buchholz AL, Hassanzadeh H. A retrospective database review of the indications, complications, and incidence of subsequent spine surgery in 12,297 spinal cord stimulator patients. *Neuromodulation* 2020; 23:634-638.
22. Garg I, Wang D. Complications of spinal cord stimulator trials and implants: A review. *Curr Pain Headache Rep* 2023; 27:837-842.
23. Mekhail NA, Mathews M, Nageeb F, Guirguis M, Mekhail MN, Cheng J. Retrospective review of 707 cases of spinal cord stimulation: indications and complications. *Pain Pract* 2011; 11:148-153.
24. Huang J, Shah N, Bailon R, Trammel S. Chronic penile pain: A poorly researched and managed life-debilitating condition. *Cureus* 2023; 15:e49776.
25. Curran N. Chronic urogenital pain in men. *Rev Pain* 2008; 2:25-28.
26. Kocjancic E, Chung E, Garzon JA, et al. International Continence Society (ICS) report on the terminology for sexual health in men with lower urinary tract (LUT) and pelvic floor (PF) dysfunction. *Neurourol Urodyn* 2022; 41:140-165.
27. Wessellmann U, Burnett AL, Heinberg LJ. The urogenital and rectal pain syndromes. *Pain* 1997; 73:269-294.
28. Delavierre D, Rigaud J, Sibert L, Labat JJ. Symptomatic approach to chronic penile pain. *Prog Urol* 2010; 20:958-961.
29. Dickstein R, Uberoi J, Munarriz R. Severe, disabling, and/or chronic penile pain associated with Peyronie disease: Management with subcutaneous steroid injection. *J Androl* 2010; 31:445-449.
30. Wordekemper B, Clifton B, Deibert CM. Cryoablation of the penile nerves for chronic penile pain. *Int J Impot Res* 2023; 35:415-418.