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General

Neuromodulation for Multifocal Pain: Successful Use of Spinal Cord Stimulation in Lumbar Spine Pain and Chronic Pancreatitis

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Chronic pain involving both the spine and visceral organs can present significant treatment challenges, especially in patients refractory to pharmacologic and interventional modalities. We report a case of a male in his late 50s with chronic axial lumbar pain due to degenerative disc disease and spondylosis, in combination with severe abdominal pain related to chronic pancreatitis. The patient failed multiple conservative treatments, including systemic medications and targeted nerve blocks. Ultimately, a spinal cord stimulator (SCS) was implanted with leads positioned at T5-T7 to capture both pain regions. The patient reported substantial improvement in both axial and abdominal pain, along with reduced opioid use. This case highlights the potential role of neuromodulation in managing complex, multifocal chronic pain syndromes.

INTRODUCTION

Chronic lumbar pain from degenerative spine disease and abdominal pain from chronic pancreatitis are both debilitating conditions that significantly impair quality of life. Abdominal pain may arise from structural or inflammatory disorders (e.g., chronic pancreatitis, inflammatory bowel disease) or functional disorders (e.g., irritable bowel syndrome, gastroparesis, functional abdominal pain syndrome). Chronic abdominal pain affects a large portion of the population and is often resistant to conventional therapies.[1,2]

The incidence of chronic pancreatitis has risen in recent years, underscoring the need for effective alternative treatments in this high-burden population.[3] Chronic pancreatitis is a progressive inflammatory disorder of the pancreas characterized by recurrent episodes of inflammation that lead to irreversible damage and fibrosis. It is associated with substantial morbidity, including persistent pain and reduced quality of life.[4] Pain is the predominant symptom in up to 80% of patients, often manifesting as chronic visceral, nociceptive, and neuropathic pain, which contribute to the development of central and peripheral sensitization and neurogenic inflammation.[5]

Multimodal pain management typically includes non-pharmacologic approaches (physical therapy, cognitive behavioral therapy, rehabilitative therapies) and pharmacologic therapy.[6] However, pharmacologic management carries inherent limitations and risks. Nonsteroidal anti-inflammatory drugs (NSAIDs) can cause renal, gastrointestinal, and, in some cases, hepatic injury.[7,8] Opioids are often prescribed but carry high abuse potential and morbidity.[9] Gabapentinoids may provide neuropathic pain relief but are associated with excessive sedation and increased risks in older adults.[10-12] Despite these strategies, many patients remain refractory to standard multimodal care, creating a need for alternative modalities.

Spinal cord stimulation (SCS), an established therapy for neuropathic pain, is increasingly being investigated for visceral pain syndromes, including chronic pancreatitis.[13-16] SCS provides an alternative strategy that targets both somatic and visceral pain pathways. This case highlights the successful application of SCS for the simultaneous treatment of chronic lumbar and abdominal pain.

CASE PRESENTATION

A male in his late 50s presented with longstanding axial low back pain secondary to lumbar degenerative disc disease and spondylosis, as well as severe epigastric abdominal pain attributed to chronic pancreatitis. His pain was significantly affecting his quality of life and daily functioning.

Pharmacologic treatments included acetaminophen, NSAIDs, gabapentin, pregabalin, tramadol, and hydrocodone/acetaminophen, all of which failed to provide adequate relief. He was maintained on oxycodone 7.5 mg every 6 hours as needed, with limited effectiveness.

Interventional procedures tried included lumbar epidural steroid injections, lumbar medial branch blocks, transversus abdominis plane blocks, and non-neurolytic celiac plexus blocks. Of these, only the celiac plexus blocks provided short-term relief of his abdominal pain.

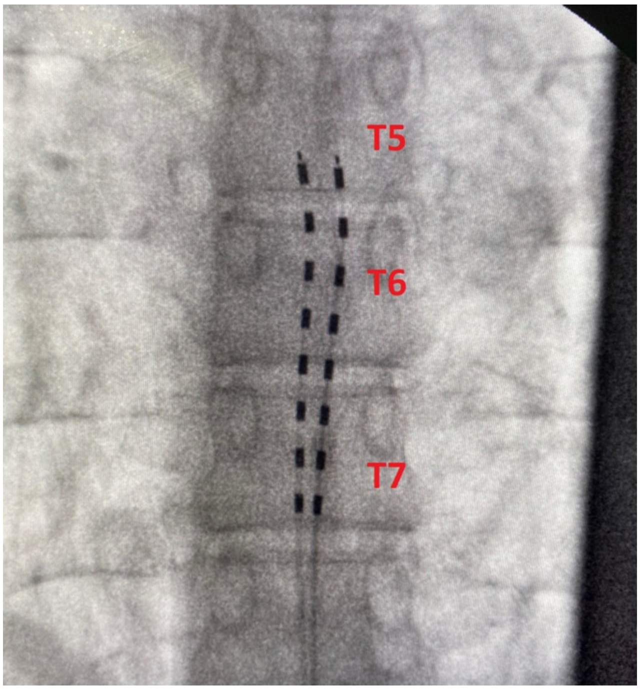

Figure 1. SCS lead placement (AP view)

Notes: Intra-operative fluoroscopic image of SCS leads at T5-T7. Lead placement provided adequate coverage for both abdominal and back pain.

Given the failure of conservative and interventional therapies, the patient was considered for neuromodulation. He underwent a SCS trial utilizing Nalu SCS technology [Nalu Medical, Carlsbad, California], during which leads were placed from the inferior border of T5 into T7, targeting both the thoracic and upper lumbar regions to capture abdominal and back pain. The trial proved successful as the patient reported 75% relief in his overall symptoms. He proceeded with permanent SCS implantation. Six weeks post-recovery, he reported a 70% reduction in axial back pain and 50% reduction in abdominal pain. He experienced improved daily function, increased mobility, and reduced his oxycodone dose to 5 mg three times daily as needed.

DISCUSSION

This case illustrates the benefit of SCS in managing multifocal chronic pain, including both somatic back pain and visceral abdominal pain. A study by Kapural et al. reported similar results where 80% of their patient population with chronic pancreatitis reported at least 50% pain relief up to 2-weeks after the implantation and up to one-year follow-up, as evidenced by the statistically significant reduction in pain scores and morphine opioid use.[14]

While SCS is widely used for conditions such as failed back surgery syndrome and complex regional pain syndrome, its role in visceral pain, such as that from chronic pancreatitis, is still in the initial stages of investigation. The proposed mechanism of SCS in treating visceral pain is to target the postsynaptic dorsal column pathway, making it a major afferent visceral pain pathway.[11] Careful lead placement at the T5–T7 levels allowed coverage of both pain regions. Importantly, the patient was able to significantly reduce opioid consumption which is a significant goal in modern pain management.

SCS has demonstrated consistent efficacy in patients with chronic radicular pain after lumbar surgery, supported by multiple randomized controlled trials that show improvements in pain and function, particularly with newer stimulation paradigms.[17,18] The American Society of Pain and Neuroscience recognizes SCS as a well-established option for refractory pain in patients with prior lumbar surgery.[17] For patients without prior surgery, observational studies and systematic reviews suggest SCS can provide meaningful benefit, although the evidence base is smaller and largely derived from case series and smaller cohorts.[19-21]

Across all patient groups, careful selection remains essential, as not all individuals experience significant pain relief, and risks such as infection, lead migration, and revision surgery must be considered against potential benefits.[22,23]

The success of SCS in this patient illustrates the utility of neuromodulation in addressing multiple pain sources, including chronic abdominal and lumbar spinal pain. Although this patient reported substantial improvement, our findings are limited by the single-case design and cannot be generalized to all patients with chronic pancreatitis or degenerative spine pain. Future investigations should focus on long-term outcomes, particularly opioid use reduction in patients with complex, multifocal pain, to better define the role of SCS in this challenging population.

CONCLUSION

SCS can serve as an effective therapeutic option for patients with complex chronic pain syndromes involving both spinal and visceral sources. In this case, neuromodulation provided meaningful pain relief, functional improvement, and a reduction in opioid reliance in a patient with lumbar spondylosis and chronic pancreatitis. These outcomes highlight the potential of SCS to address multifocal pain that is often refractory to conventional medical and interventional strategies. However, larger prospective studies are warranted to further evaluate the role of SCS in managing combined somatic and visceral pain syndromes and to better define its impact on opioid consumption, quality of life, and long-term functional status.

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