BACKGROUND

The incidence of Complex Regional Pain Syndrome (CRPS) is estimated at 26.2 per 100,000 with a 3:1 female to male distribution.1 The initial randomized control trial of neuromodulation for this disease showed superior results on visual analog scale (VAS) at 9 months compared to amputation.2-4 Our approach was to control for sensory-motor function and not to amputate the limb. We achieved pain relief in 72% of patients without amputation.5

PURPOSE & UNIQUENESS

We describe a case of left foot and ankle complex regional pain syndrome type 1 that necessitated a novel combination of a functioning dorsal root ganglion stimulation and peripheral nerve stimulation. This approach optimized pain relief, functional improvement, and avoided amputation.

CASE DESCRIPTION

A 52-year-old woman presented to our clinic with a medical history of chronic left foot and ankle pain. This pain started following a fracture of left distal fibula. She had undergone an open reduction and internal fixation and had been placed in a controlled ankle motion boot on and off over the course of 1 year. Prior to presenting to our clinic, she had a diagnosis of CRPS type 1 and had failed to improve with greater than 12 weeks of physical therapy, pain mirror box therapy, pain psychology, and several lumbar sympathetic blocks done at outside institutions. She was taking duloxetine 30 mg daily, pregabalin 200 mg three times a day, oxycodone/acetaminophen 5 mg every 6 h as needed. After discussing her options, the patient was successfully trialed and implanted with a DRG spinal cord stimulator and peripheral nerve stimulator with leads at L4, L5, S1 that provided approximately 50% pain relief for 2 years (Figure 1). Her residual pain was still limiting function and affecting her quality of life. She sought evaluation from orthopedics for an ankle arthroplasty but was advised that this is not possible and a below the knee amputation with eventual prosthesis would be her only option. Understanding the possibility of post-amputation pain and stump pain, she scheduled the below the knee amputation. In an effort to avoid this, we performed sciatic and saphenous nerve blocks as a diagnostic tool to identify the peripheral nerve dermatome which resulted in significant pain relief for the next 2 days. Two temporary PNS leads targeting the sciatic and saphenous nerves were implanted and provided 100% pain relief for the next 5 days until the sciatic lead fractured and most of her pain returned. The residual sciatic lead and saphenous lead were removed. The patient went on to a permanent PNS device, (StimRouter™, Bioventus Inc.) (Figure 2). The patient’s progress was followed for the next 120 days.

OUTCOMES

Patient reported pain intensity has improved from 7/10 to 2/10 NRS over 4 months while pain interference scores have reduced from 19 to 9 as measured by PROMIS-29 v2.1 (Figure 3).

Compared to baseline, the patient has also experienced increased physical function, and her ability to participate in social roles and activities increased over 4 months. Her use of opioid medication diminished by 75% as she is now taking oxycodone/acetaminophen 0.5 tab twice daily as needed. Allodynia has resolved, she is able to wear shoes, ambulate short distances without a cane and is considering re-entering the workforce.

DISCUSSION & CONCLUSION

This case aims to highlight the efficacy of PNS in refractory CRPS but also serves as a reminder that 50% pain relief is often not enough. When patients struggle with functional metrics despite neuromodulation of a single target, another target may be considered. The use of more than one neuromodulation therapy in a patient is not novel, as there have been many case reports discussing use of both SCS and DRGs. The use of PNS to salvage malfunctioning DRG has also been described.1 To our knowledge, this is the first case to describe the addition of PNS to a functioning DRGs therapy to avoid amputation. The patient had greater than 50% pain relief for 2 years with her DRGs, but unfortunately her residual pain led to more functional disability. The addition of PNS in conjunction with her DRGs, has allowed her to not only have more significant pain improvement, but also have increased and sustained functionality. This may be explained by the summative effect of the different mechanisms that PNS and DRGs work on CRPS. It is unknown if a patient would have a favorable outcome had she opted for PNS instead of DRGs from the start or if the relief she is experiencing today is a function of combined therapy. A prospective study comparing PNS to DRG stimulation for treatment of CRPS would be helpful in answering many of these questions.

REFERENCES