



# Scrambler therapy for chemotherapy induced neuropathic pain refractory to pharmacotherapy: a case report

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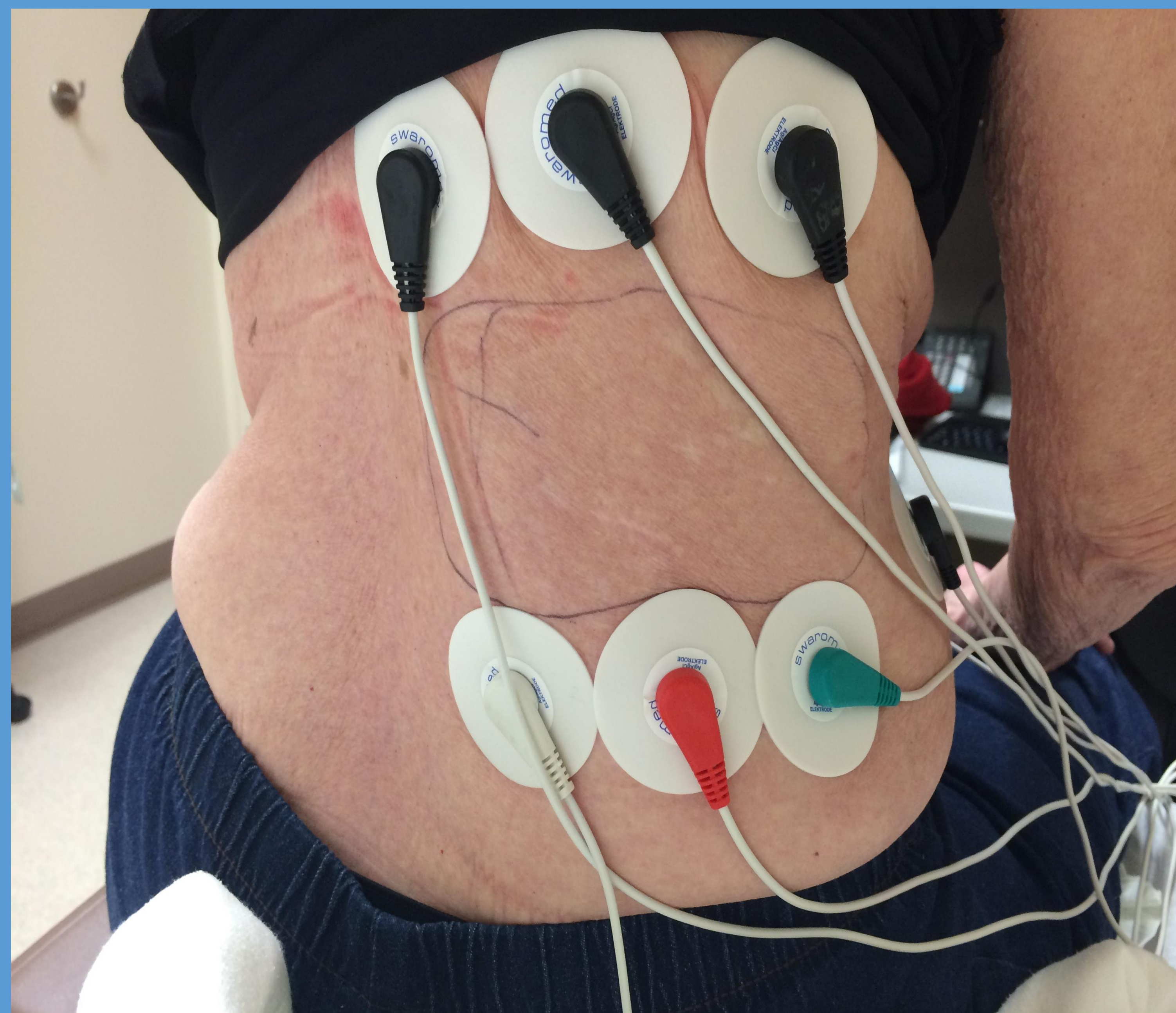
## BACKGROUND

Pain from chemotherapy-induced peripheral neuropathy is a major side effect and a common limiting factor for the utilization of chemotherapeutic agents in cancer treatment, with an incidence ranging from 30-40% of patients receiving chemotherapy (Woolf et al. 2008). Gabapentinoids and tricyclic antidepressants are commonly used as first line therapy. However, at least 10% of patients are refractory to pharmacotherapy and suffer with poorer physical health and pain-related disability (Torrance et al. 2014). Spinal cord stimulation has currently been used for these patients with variable results, but the treatment modality is invasive, costly, and requires provider expertise. Scrambler therapy, developed by Prof. Marineo, is a novel, noninvasive approach to controlling refractory neuropathic pain. This technique involves 16 different types of nerve action potentials, assembling them into sequences via complex algorithms to provide cutaneous electrical stimulation.

## CASE STUDY

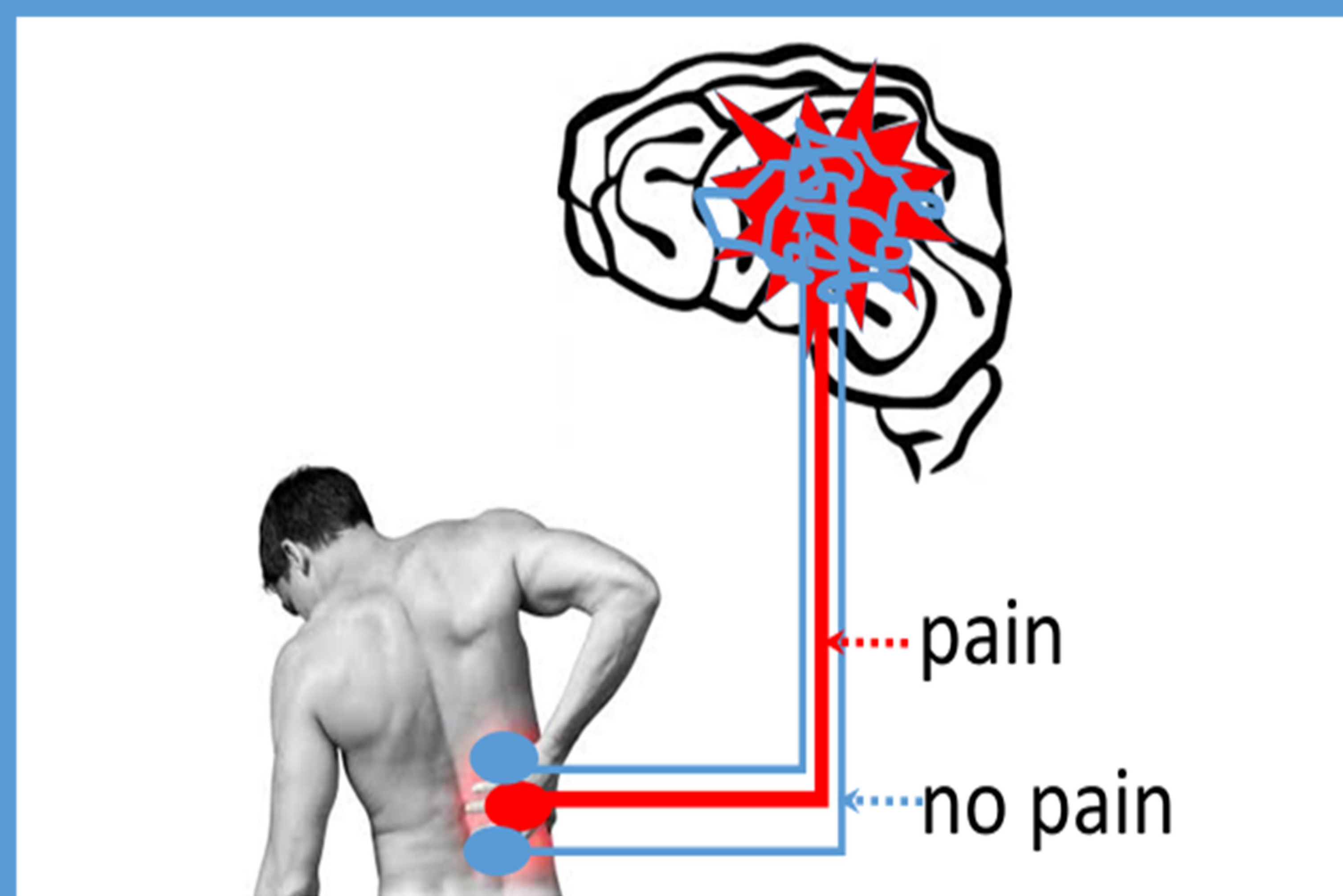
Here we report Mr. M, who is a pleasant 71-year-old gentleman with a history of multiple myeloma s/p stem cell transplant and chemotherapy. He developed chemotherapy-induced peripheral neuropathy, poorly controlled with escalating dose of Lyrica, oxycodone and tramadol. His symptoms progressively getting worse despite clinical management. Patient has many sleepless night secondary to painful symptoms, that wake him up in the middle of the night .

The patient then underwent Scrambler therapy for one 45-minute session on 10 consecutive days, excluding weekends. This treatment regimen provided him with 80-100% pain relief and improved functioning and sleep; these positive effects have been sustained for 1 month thus far.



## DISCUSSION

Scrambler therapy is an electro-cutaneous nerve stimulation device that interferes with pain signal transmission by scrambling a "non-pain" signals with 'pain' signals into the nerve fibers (See below).



To date, 20 small scale studies, have been published regarding scrambler therapy. The results were overwhelmingly positive except in one study. A large, multi-center, randomized, sham-controlled double-blinded trial, involving patients is required to define the benefit, mechanisms of action, and optimal schedule of this therapy.

## CONCLUSION

This case report provides positive empirical evidence for this therapy, which may be used as a source of hypotheses for future investigation with robust study designs to determine the role of Scrambler therapy in patients with refractory neuropathic pain.