

Peripheral Nerve Stimulation on Trial - An Illustrated Example of a Novel Workflow to Determine Candidacy Prior to Implant

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INTRODUCTION

- Peripheral nerve stimulation (PNS) utilizes the gate control theory of pain as a neuromodulation technique for pain relief.¹
- Though PNS devices have evolved and increased in utility over the years, there is currently no consensus or established protocol on the optimal workflow for a PNS trial.²
- For most patients, it is difficult to conceptualize the reduced perception of pain from PNS without prior exposure.
- In this technical report, we describe a simple, cost-effective protocol to conduct an in-office trial prior to implantation of a permanent PNS system.

METHODS

- A patient with a painful neuropathy underwent an ultrasound-guided peripheral nerve steroid injection which serves as both a diagnostic (identification of nerve target) as well as the therapeutic (in case of nerve entrapment) modality.
- During the same procedure, the patient experiences PNS electrical stimulation delivered by an external stimulator through a standard stimulating nerve block needle prior to injection of local anesthetic.

CASE REPORT

- A 28-year-old female with a five-year history of right peroneal tendonitis underwent right ankle arthroscopy, debridement, and ligament repair. She presented four years later with continued complaints of neuropathic right lateral leg pain in the distribution of the peroneal nerve. After multiple rounds of neuropathic medications, corticosteroid injections, and physical therapy proved to be unsuccessful, the patient was deemed a candidate for a PNS trial.
- The right superficial peroneal nerve was identified on ultrasound, and a 22g 50 mm stimulating needle was placed adjacent to the nerve. The stimulator was turned on at a frequency of 100 Hz and adequate coverage was obtained at 0.2 mA. Patient noted a 70% reduction in pain during that time. Subsequently, the stimulation was turned off, and 4 ml of 2% lidocaine was injected under ultrasound guidance around the nerve.



CASE REPORT (CONTINUED)

- Since the patient noted coverage of the painful area during the nerve stimulation, the decision was made to proceed with permanent peripheral nerve stimulator implant. The nerve stimulator was implanted at the same site that was tested during the nerve block. She continues to report a significant decrease in overall pain along with a decreased frequency of pain exacerbations.

DISCUSSION

- Peripheral nerve stimulation is an effective neuromodulation technique in managing chronic pain. However, there is limited literature on trialing stimulation to determine if candidates would benefit from a permanent implant.
- In our report, we describe a simple, cost-effective, and efficient in-office trial without needing specialized trial systems. For most patients without contextual pain, simply inserting a trial needle to achieve stimulation for several minutes is adequate to understand if a permanent implant can be helpful to leverage the inhibitory interneuron effect of the gate control theory of pain long-term.
- In the workflow we propose, efficiency is maximized as patients can undergo a peripheral nerve injection and experience peripheral nerve stimulation in a combined procedure to determine efficacy of a permanent peripheral nerve stimulator.

REFERENCE

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