



# Trigeminal Field Stimulation using Percutaneous Electrical Nerve Stimulation (PENS) Therapy – preliminary case series of 8 patients

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## Introduction

Patients undergoing radical surgery and/or radiotherapy for cancers in the head and neck region can present with severe neuropathic pain along the distribution of one or more branches of the trigeminal nerve. Medical management may not always be effective and dose escalation can be limited by undesirable side-effects. Neurolysis by chemical or radiofrequency lesioning of the trigeminal ganglion may be technically difficult due to the distorted anatomy and scar tissue formation; so also, some patients find the resulting numbness quite disconcerting. We are presenting a preliminary report of 8 patients with refractory pain, who underwent trigeminal field stimulation at a tertiary cancer hospital using PENS therapy, a minimally invasive repeatable treatment using a disposable percutaneous electrode.

## Methods

8 patients who had trigeminal pain following their cancer treatment underwent percutaneous electrical nerve stimulation (PENS) therapy using a 20 gauge 50 mm disposable electrode (Algotec) inserted percutaneously on the affected temporo-zygomatic region and stimulated at 2Hz and 100 Hz alternating every 3 seconds for a period of 25 minutes at voltages ranging from 1.3 to 3 volts. The aim was to stimulate the underlying trigeminal ganglion, spheno-palatine ganglion and trigeminal nerve branches.



A total of 17 treatments (including one patient who required bilateral stimulations) were carried out; all patients tolerated the procedure well. We looked at improvement in pain scores, Patient Global Impression of Change and more objectively, the reduction in symptoms like allodynia and hyperpathia and the subsequent reduction in opioid analgesics and systemic neuropathic pain medications.

## Results

7 patients reported significant pain relief immediately after the treatment; one patient reported back after 24 hours that he did not feel that the PENS made any difference and preferred to continue with his opioid medications. The minimum duration of pain relief was for 14 days and a maximum of over 175 days at the time of reporting; in 3 patients with advanced disease, the pain relief lasted till their death (one patient had a single treatment and two patients had two treatments each). Patients also reported satisfaction from their improved pain relief and better sleep at night. All of the 7 patients had good relief from symptoms of allodynia and hyperpathia at the affected area. Most patients were able to reduce their daily opioid medications and systemic neuropathic pain medications. One patient who had bilateral pains, reporting flare-up on the side that was not treated and from the next sitting onwards, we carried out simultaneous bilateral trigeminal stimulation.

## Discussion

PENS therapy for peripheral neuromodulation with percutaneously applied electrodes for trigeminal stimulation can be used to successfully manage refractory pain in the region of trigeminal innervation following cancer treatment. This is a simple and effective treatment as compared to more invasive neurolytic techniques that may be technically challenging due to the anatomical distortion and also has higher incidence of complications and unpleasant sequelae.

Based on our observations in cancer patients with trigeminal pain, we would like to propose that PENS therapy as discussed may be considered as a minimally invasive, cost-effective treatment modality for the management of primary Trigeminal Neuralgia; further studies in this patient group are required to validate this.

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