



# Percutaneous Electrical Nerve Stimulation Therapy (PENS) for treating neuropathic back pain – Case reports of two patients with back pain following surgery for soft tissue tumours of the back

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## Background & Aims

Cancer patients suffer from pain due to a variety of reasons; the disease in itself due to tumour infiltration of peripheral nerves and nerve plexuses, but also due to cancer treatment, be it radiotherapy, chemotherapy or surgery. Management of neuropathic pain in these patients has always posed a challenge to the clinician due to the complex nature of the clinical problem and also limited by either inadequate analgesia or undesirable side-effects. Neuromodulation is well known to be effective in the management of neuropathic pain and spinal or peripheral nerve stimulation are found to be beneficial in refractory cases. Implantable neurostimulators and electrodes are often unsuitable in cancer patients as they require frequent MRI scans for the follow-up of their disease and treatment and is even relevant in patients with advanced disease as they are often involved in drug trials. We have been using PENS therapy with a percutaneous disposable electrode; this offers an effective peripheral neuromodulation technique for providing good analgesia for neuropathic pain in these group of patients. There has been recent interest in the use of peripheral neuromodulation in the treatment of back pain. Here we are presenting case reports of two patients who underwent treatment with PENS for neuropathic back pain following surgery for soft tissue tumours of the back. Prior to PENS therapy, the patients were still having uncontrolled pain despite maximal medical management as tolerated and other pain interventions like nerve blocks and radiofrequency ablation of DRG and medial branch neurotomies have not been met with success in producing good analgesia.

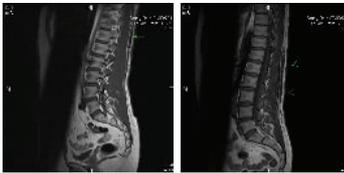
## Methods

Two male patients with longstanding back pain following the diagnosis and treatment of fibromatosis of the lumbar region and multiple soft tissue sarcomas of the left lower back respectively underwent PENS therapy using a 20 gauge 100 mm disposable electrode (Algotec) placed to close proximity of the spine in the deep tissues under imaging guidance to do peripheral field stimulation at the affected area at alternating frequencies of 2 Hz and 100 Hz every 3 seconds for a period of 25 minutes. We looked at the improvement in pain scores, Patient Global Improvement in Change and more objectively, improvement in mobility and the subsequent reduction in opioid analgesics and systemic neuropathic pain medications.

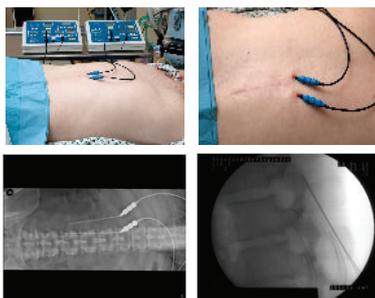


## Case 1

A 39 year old male was referred to The Christie following an open biopsy which made the diagnosis of Fibromatosis of the lumbar spine after initially presenting to the local services with progressive, debilitating back pain since 2009. At the time of presentation, the patient was complaining of severe pain, was unable to work and walked with a limp. He was referred to our pain clinic, and at this time was taking Amitriptyline 150 mg once daily and Fentanyl transdermal patches 100 mcg/hr.

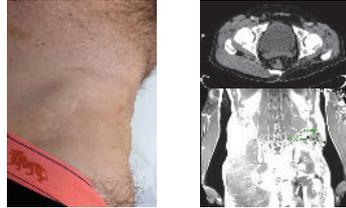


His analgesic medication was further optimized with the addition of Pregabalin 75 mg twice daily and a reduction in his Fentanyl patch to 75 mcg/hr and Amitriptyline 100mg. In April 2011 he underwent a lumbar epidural block and bilateral lower lumbar facet joint injections, which provided some pain relief for a few days. As the pain was getting worse, we then proceeded to perform radiofrequency ablations of the lumbar dorsal root ganglion (L1-L4) bilaterally. Unfortunately this provided only transient improvement in his symptoms, and upon review in the clinic some weeks later it was apparent that he was suffering from daily pain and reduced mobility. The patient subsequently underwent PENS therapy of the lumbar region. This provided excellent pain relief and return of good range of movement in the lumbar spine. At review 7 weeks' later, the patient was still reporting excellent analgesia and had resumed employment. His mood was much more positive. At this point, the patient did feel that the pain was slowly coming back; therefore a repeat PENS treatment has been arranged, but the effect of the second treatment only lasted for about 10 days. We repeated again and this time patient hasn't reported return of the pain at 9 weeks following the latest treatment with PENS therapy.

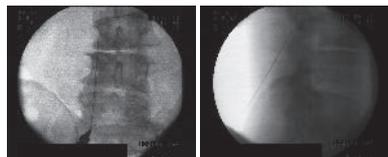


## Case 2

A 48 year old male who was first diagnosed with Mxioid Liposarcoma in the left gluteal in 1993, had multiple recurrences requiring more than a dozen operations was referred to the pain clinic in July 2012. He developed tumour recurrence in early 2008, which was not amenable to surgical resection and had to undergo palliative chemotherapy with Trebdectin; follow-up imaging showed containment of the disease. In December 2008, patient started complaining of left flank pain; the pain, sharp stabbing in nature, was localised to the lower part of the previous surgical scar. MRI scans showed no recurrence, but significant degenerative changes in the lumbar spine.



Patient was started on simple analgesics, but was later put on Gabapentin and Oxycodone along with Paracetamol and Diclofenac. Lumbar facet joint injections were performed in his local hospital in May 2012 with no real benefit and was referred to us. Patient underwent PENS therapy of the left lower back which resulted in marked improvement in his symptoms for a period of 7 weeks; he is due for his next treatment.



## Results

Both patients had good analgesia with neurostimulation using PENS therapy where standard interventions were not beneficial.

## Conclusion

PENS is minimally invasive, cheaper and gives an option to deliver neuromodulation where the use of implantable peripheral nerve stimulators are limited due to factors like MRI scans in cancer patients and also patient choice against implantation. We also propose to evaluate the use of PENS to deliver neuromodulation to facilitate early physiotherapy, mobilisation & rehabilitation as a part of the multidisciplinary approach for patients with mechanical low back pain.

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