



Peripheral Nerve Field Stimulation (PNFS) to Treat Low Back Pain

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Introduction

Peripheral nerve field stimulation (PNFS) is a new method to treat musculoskeletal pain. In this approach stimulating electrodes are placed in the subcutaneous tissue in the area of the pain without targeting a specific nerve to stimulate nerve endings in these areas. Based on the gate theory of Melzack and Wall's 1965 such stimulation would activate A-beta fibers which conduct the innocuous stimuli of vibration and position, and activate inhibitory interneurons within the substantia gelatinosa and subsequently influence the wide dynamic range neuron onto which both the large and small pain fibers synapse. This would close the gate and inhibits the cephalad conduction of pain. In this paper our experience in treating low back pain of sacroiliac origin with this approach is described.

Methods

This study retrospectively examined 21 patients with low back pain and had severe tenderness over the the sacroiliac joint(s) who received PNFS treatment. The ages ranged from 33 to 92 with a median of 60 years. There is a follow-up of 2-48 months with a median of 38 months. All patients had failed conservative treatment. They all had pain relief to sacroiliac injection with steroids but failed to receive a sustained benefit. Eighteen patients had severe tenderness over both sacroiliac joints while the others had unilateral tenderness

First, **trial Electrodes** were implanted in the subcutaneous tissue, transversely to cover the area over the sacroiliac joint(s) at its point of maximum tenderness and the midline area. Different combinations of stimulation parameters were tried; and the ones which gave the best relief of pain were used for stimulation. Those who reported satisfactory improvement in pain after a 6 day of trial had implantation of the permanent system. **Permanent electrode implant** sites were identical to the trial study and stimulation parameters were similar to the trial stimulation study.

Patients were asked to rate (1-10) before and after stimulation. Pain relief greater than 50% was considered as significant.

Results

Fifteen (71%) patients had significant improvement in their pain level and likewise they needed less medication for pain relief. Two patients needed revision of the lead position, due to lead migration and there were 2 cases of wound infections.

Conclusion: This is a simple procedure to control low back pain of sacroiliac joint origin. The results are comparable to those from fusion procedures. This procedure therefore needs further evaluation.

Learning Objectives

- 1) manage low back pain
- 2) understand the principle of peripheral nerve field stimulation
- 3) discuss the role of peripheral nerve stimulation in the treatment of low back pain

References :1. Paicius RM, Bernstein CA, Lempert-Cohen C. Peripheral nerve field stimulation for treatment of chronic low back pain: preliminary results of long-term follow up: a case series. *Neuromodulation* 2007;10:279-290.
2. Melzack R, Wall PD. Pain mechanisms: a new theory. *Science* 1965;150:971-979.

