

TITLE: Successful treatment of pelvic girdle pain with dorsal root ganglion stimulation.

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ABSTRACT

The authors report the first case of successful implantation of a dorsal root ganglion stimulator at L1 and L2 for sustained improvement in chronic pelvic girdle pain.

Keywords: DRG stimulation, dorsal root ganglion stimulation, pelvic girdle pain, neuropathic pain, chronic pain.

INTRODUCTION

Pelvic girdle pain (PGP) – previously known as ‘pubic symphysis dysfunction’ - is a debilitating condition that can lead to significant pain and disability in pregnant and postpartum females. Large patient studies report a prevalence of 16-25% in pregnant women, with a 5-8.5% incidence of clinically persistent PGP two years after childbirth¹.

CLINICAL DETAILS

A 37-year-old female presented with a nine-year history of chronic PGP. The pain initially presented during the patient’s first pregnancy, improving after delivery, but was exacerbated by 2nd and 3rd pregnancies. The pain was described as a sharp pelvic pain usually radiating to her left leg, hip and occasionally to her whole body. The pain was exacerbated on movement, and as a result she was unable to mobilise and had been bed bound for the last three years. On presurgical examination, the patient reported an average pain of 7/10 on a numerical rating scale and, at worst, a pain score of 10/10. The McGill Pain Questionnaire (MPQ) total score was 52 (Sensory 29; Affective 9; Evaluative 3; Miscellaneous 11). A previous MRI of the pelvic region was normal and as a result it was felt surgical intervention would not be beneficial. Prior to admission the patient had had trials of physiotherapy, gabapentin and steroid injections all without effect on the intensity of the pain. On the day of admission, the patient was receiving oral treatment with paracetamol 1g four times daily, diazepam 5 mg p.r.n., MST 60mg twice daily, zomorph 10mg twice daily and amitriptyline 25mg once daily. After failing to obtain significant benefit from medical measures, a trial of dorsal root ganglion (DRG) stimulation was performed.

The procedure was performed under local anaesthesia and sedation to allow intra-operative patient feedback to verify satisfactory location of the leads. Fluoroscopy was used to identify spinal levels for lead placement and to guide lead delivery. In the prone position, epidural access was obtained percutaneously using two Tuohy needles at L2/3 and L3/4, two levels below the targeted spinal segments, with a loss of resistance technique. Using an introducer sheath (Spinal Modulation Inc., California, USA) the leads were steered laterally through the epidural space into the dorsal superior part of the left L1 and L2 neural foramina (Figure 1). The leads were connected to an external neurostimulator and the paraesthesia was tested to confirm overlap with the painful regions. The leads were then anchored with the custom anchors provided, and tunneled laterally through the skin to a small subcutaneous pocket where temporary lead extensions were attached. These temporary extensions were tunneled out through the skin to allow the external trial stimulator to be used on the ward for a trial period of 7 days to allow optimization of paraesthesia and pain relief. Intraoperative and postoperative program parameters were within the following ranges: voltage 575-650 μ A, pulse width 200-530 μ sec, frequency 20-40 Hz and impedance 911-1016 ohms for lead A stimulating the DRG at L1, and 750mV, 300msec, 20-40Hz and 895 ohms for lead B stimulating the DRG at L2. After the trial period a pulse generator was implanted in a pocket in the right upper quadrant of the abdomen and connected to the DRG leads with new permanent extension wires.

The postoperative period was uneventful and the patient reported few side effects. Lead A stimulating the left DRG at L1 gave pain relief of the suprapubic region. Lead B stimulating the left DRG at L2 relieved pain down the left leg. Initial intraoperative

stimulation was on the edge of perception, as the patient found the higher settings uncomfortable. In the initial stages of the postoperative period (day 1-2) the patient felt that the pain of the operation was overriding the stimulatory relief. By day 5-6 the patient was able to mobilise up and down stairs and reported good coverage of the paraesthesia and pain relief in the left leg and suprapubic region. At 6-month follow up the patient reported an average pain of 4/10, a 43% pain reduction. The MPQ total pain score was 37 (Sensory 21; Affective 5; Evaluative 4; Miscellaneous 11), a 29% reduction. The patient reported a significant improvement in quality of life; she was no longer bed bound and was able to mobilise freely including up and down stairs.

DISCUSSION

We report the first case of DRG stimulation as a successful treatment for neuropathic PGP. DRG stimulation is an emerging treatment for chronic neuropathic pain, providing an alternative to more traditional spinal cord stimulation (SCS). By stimulating specific cell bodies in the DRG, compared to SCS that recruits multiple fibres in the dorsal columns, DRG stimulation is able to target specific anatomical locations with a dermatomal pattern of paraesthesia coverage. This makes it a desirable choice of treatment for focal pain in regions difficult to treat with SCS such as the groin and foot.

Current treatment for PGP including conservative measures such as support belts, physiotherapy and analgesics lead to only slight improvements in those with prolonged PGP. Previous studies have reported sacral nerve stimulation as a successful treatment for pelvic pain linked to voiding disorders², but never specifically for PGP. A recent trial of DRG stimulation for neuropathic groin pain reported a 70% average pain reduction, with

82.6% of patients experiencing a greater than 50% reduction in their pain³. The fact that the ilioinguinal and iliohypogastric nerves implicated in groin pain also innervate the pubic symphysis and sacroiliac joints suggested that DRG stimulation may provide a successful alternative treatment for neuropathic PGP. This case report confirms that it can do so and provides grounds for the evaluation of DRG stimulation in other chronic pelvic pain disorders.

AUTHORSHIP CONTRIBUTIONS

Mr Alex Green and Mr James FitzGerald conducted the study. Mrs Liz Moir helped to conduct the study through data collection. Mr David Rowland carried out data analysis and prepared the manuscript with important intellectual input from Mr Daniel Wright, Mrs Liz Moir, Mr James FitzGerald and Mr Alex Green. All authors approved the final manuscript. None of the authors have a conflict of interest.

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LEGENDS

Figure 1. Images show final position of the two leads, on the left at the spinal levels L1 and L2 in the anterior-posterior (A) and lateral (B) view.