

Case Report

# Treatment of glenohumeral arthritis pain utilizing spinal cord stimulation

Stephen T. Susa, Chris S. Karas, Nathaniel K. Long<sup>1</sup>

Departments of Neurosurgery, <sup>1</sup>Orthopedics, Grant Medical Center, Columbus, Ohio, USA

E-mail: \*Stephen T. Susa - [sts107@pitt.edu](mailto:sts107@pitt.edu); Chris S. Karas - [chris.karas@ohiohealth.com](mailto:chris.karas@ohiohealth.com); Nathaniel K. Long - [nathaniel.long@ohiohealth.com](mailto:nathaniel.long@ohiohealth.com)

\*Corresponding author

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## Abstract

**Background:** Dorsal column stimulation may be utilized to treat non-neuropathic pain attributed to glenohumeral arthritis.

**Case Description:** An 84-year-old female presented with right shoulder pain for 3 years. She was diagnosed with glenohumeral arthritis and a complete loss of the joint space. She was treated with a dorsal column stimulator, requiring the electrodes to be placed from the inferior aspect of C3 to the superior aspect of T1. Six weeks postoperatively, she reported >90% coverage of her shoulder pain, demonstrated increased right arm function, and a reduction in her use of narcotics.

**Conclusion:** Dorsal column stimulation of C3–T1 proved to be an effective alternative treatment for drug-resistant glenohumeral arthritis in an 84-year-old female with a complete loss of the joint space.

**Key Words:** Arthritis, dorsal column stimulation, glenohumeral arthritis, pain management, spinal cord stimulation

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## INTRODUCTION

Glenohumeral arthritis impacts approximately 32% of individuals over the age of 60.<sup>[4]</sup> It is attributed to a reduction of the joint space between the humerus and the glenoid, as well as inflammation leading to stiffness and pain. The shoulder capsule is innervated by four nerves of the brachial plexus – the axillary nerve, suprascapular nerve, subscapular nerve, and lateral pectoral nerve.<sup>[3]</sup> As each of these nerves enters the spinal cord between the C5 and C7 levels, patients with severe glenohumeral arthritis may be treated with a spinal cord stimulator placed between the C4 and C8 nerve roots. Such therapy successfully reduces up to 90% of the pain and allows patients to regain lost function and range of motion.

## CASE REPORT

### Clinical parameters

An 84-year-old female presented with pain and stiffness in her right shoulder of 3 years duration. She was diagnosed with glenohumeral joint arthritis, a complete loss of the joint space, the inability to abduct her arm

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**Figure 1: Anterior/posterior X-ray of the patient's cervical spine, showing electrode positioning**



**Figure 2: Lateral X-ray of the patient's cervical spine, showing electrode positioning**

more than 15 degrees, the loss of active or passive motion of her right arm (i.e. frozen shoulder), and severe pain. Prior conservative management had been unsuccessful including several cortisone injections and narcotics. Ultimately, she was offered the placement of a cervical C3–T1 spinal cord stimulator.

### Spinal cord stimulator

A dual-lead, right-sided 16-electrode spinal cord stimulator was placed between the C3–T1 levels (i.e. to cover the C4–C8 roots) utilizing intraoperative X-ray [Figures 1 and 2]. Postoperatively, at 6 weeks and 3 months, her shoulder pain was reduced by >90%, and she had increased range of motion/function in her right arm with a reduction in narcotic use.

## DISCUSSION

Glenohumeral arthritis results from the reduction of the joint space between the humerus and the glenoid that leads to grinding friction/inflammation, causing stiffness and pain.<sup>[2]</sup> Conservative management, consisting of injectable corticosteroids, ice and heat therapy, nonsteroidal anti-inflammatory drugs, and opioid analgesics along with physical therapy, were unsuccessful in treating this patient. Due to her advanced age and frail condition, surgery, consisting of either arthroscopy or joint replacement, was not considered ideal.<sup>[1]</sup>

Rather, a right-sided C3–T1 spinal cord stimulator (SCS) (i.e., dorsal column stimulation of the C4–C8 roots), typically used for treating chronic neuropathic pain, was implanted.<sup>[5]</sup> The minimally-invasive implantation of the stimulator successfully relieved this patient's pain, increased her arm range of motion, and markedly reduced her use of narcotics by reducing her pain by 90%; arthroscopy and arthroplasty were both avoided. Here, spinal cord stimulation was a successful alternative to invasive shoulder procedures/surgery in an elderly patient with glenohumeral arthritis.

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### Conflicts of interest

There are no conflicts of interest.

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