

Wireless high frequency stimulation of the brachial plexus for cancer pain. A case report

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Abstract

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Abstract

Introduction

This case report details the application of a PNS System in a patient with intractable cancer-related neuropathic pain.

Methods

Case Description

A 41-year-old woman was referred to our center for intractable pain due to pectoral metastasis from ductal mammary carcinoma after a skin-sparing unilateral mastectomy.

We first met with the patient in August 2022. Her pain was rated at 9/10 on the Numeric Rating Scale (NRS) at that time with a DN4 neuropathic score of 7. The patient complained of sharp, burning, continuous pain in the right arm related to compression of the brachial plexus. Allodynia and painful hypoesthesia were present distal to the elbow.

We modified her therapy using pregabalin and tramadol, then oral morphine along with ibuprofen and prednisone 25 mg. This resulted in an improvement of 2 points on the NRS at rest but led to the onset of refractory Opioid-Induced Bowel Dysfunction. A block with lidocaine 0.5% 10 ml of the brachial plexus under ultrasound guidance was performed, resulting in the sudden disappearance of pain for 12 hours.

Pain scores were reported with the NRS at 8/10 before the implant, Oswestry Disability Index (ODI) was 66%, EQ-5D-5L was 24444 (valueset for US 0.349), and QoL 20%.

In January 2023, the patient received a permanent Freedom PNS System.

Permanent Implant Surgical Technique

The implant site was cleaned and covered with sterile drapes. The needle entry point and pathway were planned using ultrasound and fluoroscopy. An incision was made in the right lateral clavicular region, and the cannula was then positioned in the subclavian region, where stimulation covering the entire upper limb was achieved. The receiver part was tunneled along the humerus. The subject was programmed using paresthesia-free stimulation patterns with a frequency of 1,499 Hz with amplitudes of 1.2-1.5 mA and was used for 14 hours per day.

Results

After 7 days, the ODI was 12%, QoL 100%, EQ-5D-5L 22211 (valueset for US 0.799), and NRS was 2/10 (mainly for symptoms related to chemotherapy). All drugs were stopped except for ibuprofen 600 mg when needed. The improvement was maintained for 4 months post-permanent implant.

After four months, abdominal pain related to multiple metastases occurred. Twenty days later, the patient passed away due to multiple organ failure.

Conclusion

In the presented case, the patient suffered from severe, intractable pain due to pectoral metastasis from ductal mammary carcinoma. Despite multiple pharmacological interventions, her pain remained poorly controlled, and the side effects of the medications significantly impacted her quality of life. The introduction of the Freedom PNS System provided substantial pain relief and improved her overall functionality and quality of life.

A cervical spinal cord stimulator was considered, but the patient refused to implant the generator. Moreover, the Freedom PNS maintains MRI compatibility despite the location of the catheter and permits paresthesia-free stimulation. PNS can be considered an effective, minimally invasive, and safe therapy for treating patients with chronic localized pain due to cancer, which has been resistant to conservative therapy.

References:

1. Helm S et al. Peripheral Nerve Stimulation for Chronic Pain: A Systematic Review of Effectiveness and Safety. *Pain Ther.* 2021 Dec;10(2):985-1002.