



C2-3 NERVE STIMULATION FOR TREATMENT OF OCCIPITAL NEURALGIA

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Introduction

Occipital neuralgia is a rare condition that can be very disabling to patients who suffer from it. It has been described as a sharp or stabbing pain that travels along the path of either the greater, lesser and third occipital nerves. Etiology can be neurologic, vascular, or musculoskeletal. The occipital nerves consists of the greater occipital nerve (GON), lesser occipital nerve (LON), and third occipital nerve (TON). The GON originates from the medial branch of the C2 dorsal ramus. The LON originates from the ventral ramus of C2 and C3. Treatment can be challenging. Conservative treatments such as medications are usually first line, but these are often ineffective for patients trialing them. Nerve blocks, onabotulinumtoxinA injections, radiofrequency ablation, peripheral nerve stimulation and surgical management have been utilized as treatments with varying effectiveness.

Peripheral nerve stimulation carries the advantages of being minimally invasive, having adjustable settings, and being easy to remove. There is limited research in peripheral nerve stimulation for occipital neuralgia currently. The following case report describes a bilateral C2-3 peripheral nerve stimulator for treatment of occipital neuralgia.

Past Medical History and Methods

The chart of a 25 year old man with past medical history of bilateral occipital neuralgia, peripheral neuropathy, chronic headache, neck pain, cervical facet arthropathy, and depression was retrospectively reviewed. IRB approval was not required by UW Health as a single case does not qualify as a systematic investigation and the report was de-identified of patient information. Consent was obtained from the patient to proceed with this report.

Clinical Case

The patient described in this case presented with a history of ten years of headaches starting after a concussion sustained while playing football. The patient described his pain as constant, throbbing bilateral 3-4/10 pain reaching 10/10 at worst. He also endorsed stabbing pain behind his eyes. The pain was worse with reading or any activity, particularly activities involving movement such as riding in a car. The pain improved with rest. He stated that when the headache was very severe, it would radiate up the back of his head and up the sides. The pain inhibited the patient from doing any activities including going to school and holding a job.

At the time of presentation, the patient was not taking any medications as none had helped. He had tried multiple medications including acetaminophen, NSAIDS, lamotrigine, gabapentin, sodium valproate, topiramte, zonisamide, amitriptyline, cyclobenzaprine, sumatriptan, DHE, rizatriptan, and IV lidocaine infusions. He had also tried procedures including trans-nasal sphenopalatine blocks and occipital nerve blocks as well as onabotulinumtoxinA injections. He reported that physical therapy with dry needling had provided him some relief in the past. In 2019, the patient trialed an occipital nerve stimulator that he felt did not work. In addition, the patient was followed by pain psychology.

After discussion of treatment options, he decided to proceed with peripheral nerve stimulator again. Patient underwent bilateral C2,3 MBB/TON block under fluoroscopic guidance in June 2022 with greater than 50% improvement in symptoms after the first day. In January of 2023, he underwent bilateral C2-3 Medial Branch Peripheral Nerve Stimulator Trial. He then reported approximately 60% improvement over baseline pain, and the decision was made to proceed with placement of a permanent device.

In March of 2023, the patient underwent placement of bilateral C2-3/TON peripheral nerve stimulation under fluoroscopic guidance. Risks, benefits and alternatives were discussed with the patient and consent was obtained. The patient was then placed in the right lateral position, and the affected area was carefully outlined with a marker. Appropriate skin and bony landmarks were identified, pertinent vascular structures were located, and then the skin overlying the neck and upper back region were prepped and draped in sterile fashion. Fluoroscopy was then used to identify the area, and the skin subcutaneous tissues were injected with local anesthetic. A one cm incision was made above the low cervical region on the right side. An introducer needle and catheter was inserted and advanced along the intended course of the C2-3/TON nerves under fluoroscopic guidance. Then stylet was removed, and an eight contacts lead was placed through the catheter. This process was then repeated on the left side. After this was completed, another 1 cm incision was made at the left upper back for internal pulse generator placement. Testing was done to confirm good impedances at all contacts.

At follow-up in April 2023, the patient reported his headaches had much improved. He no longer endorsed stabbing, debilitating posterior headaches. He did endorse 2/10 dull headaches, but he felt his symptoms were dramatically improved.

Discussion

C2-3 peripheral nerve stimulation is a technique that could be useful in the treatment of occipital neuralgia. More research is needed in determining the clinical utility of this technique. As this condition is difficult to treat and debilitating for patients that suffer from it, this case report presents another possible viable option for treatment to patients to find relief from their symptoms.

References

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