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General

Peripheral Nerve Stimulation of the Lesser Occipital and Greater Auricular Nerve for Post Herpetic Neuralgia in a Case of Ramsay Hunt Syndrome: Case Report

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Background

Post-herpetic neuralgia (PHN) is a painful condition that presents after herpes zoster reactivation in the peripheral and central nervous system. When medical treatment fails, options are limited, and patients may suffer with chronic pain indefinitely.

Case Presentation

We present the case of a gentleman with a 3-year history of PHN in the distribution of the right lesser occipital and greater auricular nerves that failed to respond to medical treatment. He underwent a trial of neuromodulation, and post-operative pain scores improved by 80%, and at 60 days post-operatively his average pain score was 0 out of 10.

Conclusions

PNS is an effective and safe option for the treatment of chronic pain, and we present a report of successful treatment of PHN in a particularly difficult anatomic distribution. PNS of the lesser occipital and greater auricular nerves is a novel treatment for PHN and shows promise as an effective, safe therapy when other treatment fails.

BACKGROUND

Post-herpetic neuralgia (PHN) is a neuropathic pain condition following an outbreak of herpes zoster. Herpes zoster (HZ) is a neurocutaneous viral infection stemming from the reactivation of the varicella zoster virus. The virus lies dormant in the spinal or cranial sensory ganglion, and when reactivated, causes an acute, painful condition. HZ primarily affects elderly individuals but may present at any age.[1] When PHN affects the scalp and periauricular region, this poses a difficult to treat clinical scenario. Ramsay Hunt Syndrome is a rare complication of herpes zoster wherein latent varicella zoster virus infects the geniculate ganglion. Patients present with auricular vesicles, otalgia and peripheral facial paralysis.[2] Recommended treatment for PHN includes neuropathic agents, antidepressants and topical creams and patches.[3] When these treatments fail to control pain, neuromodulation is a promising, emerging option for patients with PHN. Peripheral nerve stimulation (PNS) has been used to treat a variety of facial and cranial neuralgias.[4] We present a case of successful PNS to the lesser occipital and greater auricular nerves for PHN.

CASE REPORT

A man in his 80's was referred to our clinic with a three-year history of right-sided posterior scalp and periauricular pain after herpes zoster infection presenting as Ramsay Hunt Syndrome. He rated the pain between 6-10 and averaging a 9 on a scale of 10 with distribution in the right occipital and periauricular areas.

The patient had previously trialed multiple oral and topical medication treatments, and at the time of presentation was on a regimen of gabapentin and turmeric with little relief of his facial and head pain. He had previously been treated with botulinum toxin injections without any relief. The patient was referred to the neurosurgery service for discussion of a C2-3 diagnostic block and potential follow-up open neurectomy, but prior to undergoing more invasive treatments the patient preferred to explore less-invasive and lower risk treatments. He elected to forgo diagnostic nerve block prior given the risks of such.

Given the resistant nature of his pain to all recommended therapies, trial of neuromodulation using the SPR 60-day peripheral nerve stimulator system was offered to the patient in the distribution of the right lesser occipital and right greater auricular nerves, to which he consented.

The patient was brought to the procedure suite, and, prior to the procedure, ultrasound guidance was used to

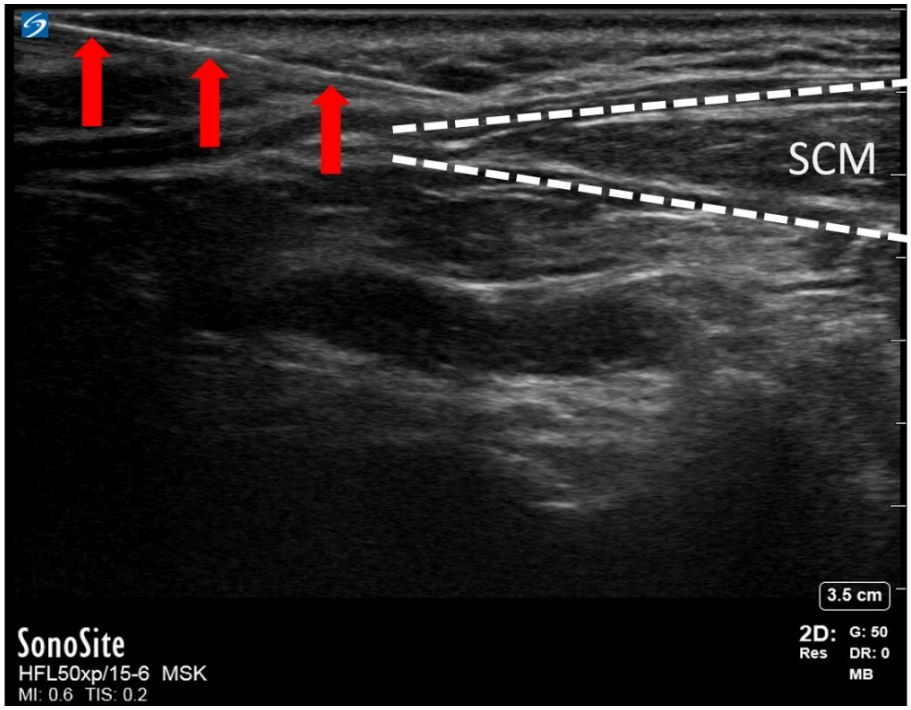

Figure 1. Ultrasound guided needle (red arrows) placement, SCM outlined in white

visualize the right lesser occipital and greater auricular nerves. Ultrasound imaging identified the optimal needle path of the affected target nerves. The skin was then prepped and draped in the usual sterile fashion using chlorhexidine and alcohol. 1% lidocaine was placed to create a local skin wheal. Next, using a combined in-plane and out-of-plane technique (Figure 1), a linear array electrode was advanced in close proximity to the right lesser occipital nerve and right greater auricular nerve. After minimal manipulation, excellent stimulation was obtained (stimulation parameters: frequency: 12 Hz; duty cycle: 50%; amplitude range: 0–30 mA; pulse duration range: 10–200 μs). There was no evidence of bruising or significant soft tissue damage. The patient was discharged in stable condition with no untoward side effects. Immediately post-operatively the patient reported reduction of pain to 1-2 out of 10 after stimulation and implantation.

The patient returned for lead removal on post-procedural day 65. He reported 90% improvement in the presence of his symptoms with pain averaging a 0 out of 10. The patient reported no side effects or complications since the procedure. Leads were removed without complication.

Patient consent was obtained to use photographs for purposes of medical education, and the patient approved reporting of the case.

DISCUSSION

PHN is a painful condition that, in some cases, may persist indefinitely after an outbreak of herpes zoster (HZ). The pathophysiology of HZ is a complex and phenotypically heterogenous,[5] and the pain is a consequence of direct damage to peripheral sensory nerves by herpes zoster virus. Neuron damage is known to extend from spinal cord to skin, making it a uniquely painful condition.[6]

HZ usually manifests as a vesicular rash that progresses to a crusted lesion in the distribution of a unilateral dermatome. The patient will usually complain of an itching, tingling, painful sensation both preceding and accompanying the rash.[7] In most cases the skin lesions heal within one month, as does the painful sensation. Unfortunately, 20% of patients report pain at 3 months after lesion healing, and 15% of patients report pain at 2 years.[8] PHN is classically defined as pain in the distribution of the HZ rash that persists longer than 3 months from rash healing.[9]

The sites most affected by PHN include the thoracic dermatomes (47.9%), followed by the trigeminal ganglion (21.4%), cervical dermatomes (16%), lumbar dermatomes (11%), and sacral dermatomes (1%).[9] HZ and PHN of the occipital and auricular nerve territories (C2/3 spinal nerves) are relatively rare, and few reports of their treatment exist.

PHN is notoriously difficult to treat with a significant percentage of patients achieving only temporary or partial relief with recommended, multimodal therapy regimens.[10, 11] Current guidelines recommend tricyclic antidepressants, serotonin norepinephrine reuptake inhibitors, gabapentin, pregabalin and topical lidocaine as first-line medication with topical capsaicin and opioids as second-line.[12]

When medical management fails, patients are considered for interventional treatments and procedures. Invasive therapies with promising results in the literature include botulinum toxin injections, epidural/intrathecal injections, local anesthetic neuronal blockade, and spinal cord stimulation.[13] Peripheral nerve stimulation is a relatively new, evolving modality for the treatment of PHN showing promising results in the treatment of refractory pain. Further, it's becoming more apparent through recent research

that the early treatment of PHN with medications accompanied by interventional therapies offers the best chance at both treating pain and preventing chronic pain symptoms.[14]

CONCLUSION

The interventional treatment of occipital and auricular nerve PHN offers a unique challenge in that the affected nerve roots are inaccessible to effective modalities such as epidural and intrathecal injection and spinal cord stimulation. Previous reports have demonstrated that PNS is an effective and safe option for treating various intractable pain conditions including cancer pain, cervicogenic headache, thoracic PHN, trigeminal neuralgia following herpes zoster outbreak, occipital neuralgia, migraines, and craniofacial pain,[15,16] but few reports of PNS describing or treating PHN of the occipital and auricular nerve distributions are available in the literature.

This report offers the description of a novel, safe treatment modality for a historically difficult to treat pain condition. After failing conventional treatments, the patient underwent PNS placement with immediate and sustained resolution of pain symptoms at 60 days post-op. This case establishes that in complex cases of PHN of the scalp and periauricular area, PNS of the lesser occipital and greater auricular nerves may be a safe and effective treatment option for pain relief, adding to an increasing amount of evidence that neuromodulation is a safe, effective modality for the treatment of resistant PHN.

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