# Peripheral Nerve Stimulation of the Occipital Nerve to Treat Postherpetic Neuralgia

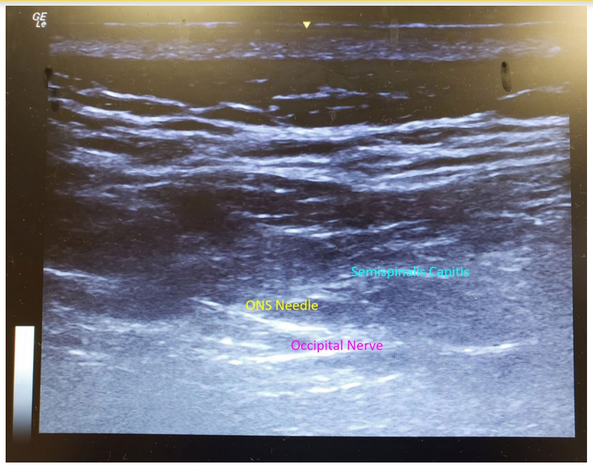
Yashar Eshraghi, MD[1], Roshina Khan, MD[1], Harlan Stern, MD[1], Marianne Gelter, MD[1], Maged Guirguis, MD[1].
1. Ochsner Clinic Foundation, New Orleans, LA.

## Introduction

Herpes zoster infection and subsequent postherpetic neuralgia (PHN) can cause chronic neuropathic pain. PHN occurs in about 40% of HZV patients who are older than 50 years and about 75% of those over 75 (1). A study found that less than half of patients with PHN treated with pharmacotherapy experience pain reduction greater than 50% (2). Patients who do not respond well to pharmacotherapy require more invasive therapeutic options. Occipital nerve stimulation (ONS) involves the placement of peripheral nerve-stimulating electrodes over the occipital nerves to produce paresthesia along the territory innervated by those nerves. We present a case of intractable PHN refractory to conservative pharmacological treatment and multiple occipital nerve blocks, which was successfully treated by using ONS with an external implantable pulse generator (IPG).

## Case Presentation

An 80-year-old man presented with a chief complaint of burning, sharp, shooting and throbbing pain located on the left side of his head and radiating to the left side of his face consistent with post-herpetic neuralgia. His symptoms interfered with his daily activities, ability to exercise, and sleeping. The pain started 2 months ago following a shingles outbreak and had been worsening since onset. The patient was taking gabapentin 300 mg TID and hydrocodone-acetaminophen 10-325 without relief. Following evaluation, he was prescribed a 5% lidocaine topical cream and scheduled for a left occipital nerve block (ONB) with 0.25% bupivacaine and triamcinolone. At an appointment following the ONB, the patient reported complete relief in his post-herpetic neuralgia pain; however, his relief was only temporary, lasting approximately 2 days. He was then instructed to discontinue gabapentin and prescribed duloxetine 30 mg daily in conjunction with the topical lidocaine cream.




**Ultrasound of Occipital Nerve Stimulation**

Six weeks later, the patient presented for follow-up stating he did not tolerate taking duloxetine and had restarted his gabapentin. He was instructed to gradually increase his gabapentin dose to 600 mg TID. Three months later, the patient reported no improvement in his pain. At this time, he was scheduled for a repeat left occipital nerve block with bupivacaine and dexamethasone and prescribed a compounded topical cream. Following the repeat left ONB, the patient reported 2 days of complete pain relief followed by return of his symptoms with only mild improvement attributed to gabapentin.

After a discussion with the patient and his wife, it was determined that he would likely benefit from peripheral nerve stimulation of the left occipital nerve. Occipital nerve radiofrequency ablation was not considered in this patient due to the potential increased risk of anesthesia dolorosa with this procedure. The patient provided informed consent for implantation of the peripheral nerve stimulator lead and the peripheral nerve stimulator receiver – implantable pulse generator. Following a procedure without complications, he was seen one week later for placement of the external communicating generator, which was uncomplicated. At a follow-up appointment six weeks after his peripheral nerve stimulator placement, the patient reported near complete resolution (approximately 80% pain relief) of his post-herpetic neuralgia pain, rating his pain 2/10 down from 10/10 at initial presentation. The patient also noted an improvement in his ability to perform his daily activities and cited he was able to start exercising again.

## Discussion

Occipital Nerve Stimulation (ONS) exists as a minimally invasive and reversible intervention for occipital neuralgia as well as chronic daily headaches intractable to conservative medical management. ONS is indicated in patients with refractory chronic headache or occipital neuralgia which may occur as PHN. Efficacy has been demonstrated in randomized control studies for migraine related pain while benefit in postherpetic neuralgia and other forms of chronic daily headache continue to be found (3). An evidence-based guideline generated by systematic literature review in the journal *Neurosurgery*, recommends the ONS in the treatment of refractory occipital neuralgia (4). Candidate patients are those who have failed medication management as well as possibly botox therapy. After percutaneous trial using subcutaneous electrodes placed within the superficial cervical fascia at the C1 level has demonstrated 50% decrease in headache intensity or frequency, then practitioners should consider implantation. Recent metanalysis have been conducted aiming to identify optimal treatment pathways in the utilization of ONS. Findings indicate that proper diagnosis is critical to successful trial and treatment. Practitioners should be aware that the neuromodulatory activity of ONS can take longer than two weeks to take effect. It should be noted that ONS implantation is entirely reversible. The most commonly cited complication is lead migration or lead breakage, and this is likely due to the highly mobile cervical anatomy. Furthermore, placing long leads for an internal IPG is difficult due to the high-risk anatomy of the posterior neck. Using an external IPG makes the ONS procedure significantly less invasive, by avoiding the need for tunneling for IPG implantation, and technically less difficult with less discomfort to patients. Postherpetic neuralgia causing occipital neuralgia is less common than in the distribution of the trigeminal nerve, which accounts for the lack of prospective studies in this specific patient population. However, the evidence of benefit from ONS in occipital neuralgia is strong and should be discussed with PHN patients as a potential

## References

1. Chen N, Li Q, Yang J, Zhou M, He L. Antiviral treatment for preventing postherpetic neuralgia. Cochrane Database Syst Rev 2014;(2):CD006866.
2. Lawrence R. Bernstein, PhD, Successful Treatment of Refractory Postherpetic Neuralgia with Topical Gallium Maltolate: Case Report, Pain Medicine, Volume 13, Issue 7, Jul 2012, Pg 915–918.
3. Silberstein, 2012 Dec;32(16):1165-79. doi: 10.1177/0333102412462642. Epub 2012 Oct 3.
4. Sweet, Neurosurgery. 2015 Sep;77(3):332-41. doi: 10.1227/NEU.0000000000000872.