

Technical Notes & Surgical Techniques

Reappraisal of microsurgical decompression and neurectomy of the occipital nerve in the treatment of occipital neuralgia



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1. Introduction

Occipital neuralgia is defined by the international headache society (IHS) as a unilateral or bilateral paroxysmal, shooting or stabbing pain in the posterior part of the scalp, in the distribution of the greater and lesser occipital nerves, sometimes accompanied by diminished sensation or dysaesthesia in the affected area and commonly associated with tenderness over the involved nerve(s) [1]. This pain usually originates in the suboccipital region and irradiates to the vertex.

There is no definitive data about the prevalence or incidence of occipital neuralgia, there is a Dutch study which reported a low incidence of 3.2 per 100,000 [2]. However this is the only study that exists to date and is thought to be an underdiagnosed entity due to the number of differential diagnosis that is possible.

Many etiologies of occipital neuralgia have been reported in the literature, however the most common one is of compressive origin either by trauma which causes subsequent fibrosis or by muscle contraction [3].

There are currently various accepted treatment methods reported in the literature, ranging from medical treatment using

neuropathic agents such as antiepileptic and/or antidepressant medications which is considered as the first line of treatment, local injections to the nerve using local anesthetics combined with steroids are also considered a treatment as well as a diagnostic test, lately nerve stimulation has been given much attention and even a systematic review and evidence-based guideline was published about this method concluding that it has a level III recommendation strength [4].

Neurostimulation of the occipital nerve or occipital nerve stimulation is a relatively new technique which is made inserting subcutaneous electrodes in the C1–C2 region of the posterior cervical spine and passing current through them. It is believed that this results in activation of the C1–C3 cervical nerves afferents as well as the trigeminal afferents through the convergence that happens between these fibers. This is an alternate technique opposed to destructive surgery. If the patient does not want to continue the treatment, the device can be removed with a simple procedure [3].

Neurolysis of the occipital nerve (with or without sectioning of the inferior oblique muscle), C2 gangliotomy, C2 ganglionectomy, C2 to C3 rhizotomy, C2 to C3 root decompression, and neurectomy were historically introduced for medically re-fractory patients [5–9]. But ultimately have lost its place in favor of nerve stimulation.

Our aim in this study is to report our experience and treatment algorithm with our modified neurectomy surgical technique which provides excellent results in pain control for patients who suffer occipital neuralgia and that can be considered as a safe alternative when neurostimulation and radiofrequency are not available.

Abbreviations: GON, greater occipital nerve; LON, lesser occipital nerve; III ON, third occipital nerve; BNIPS, Barrow Neurological Institute Pain Score; VAS, Visual Analogue Scale.

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Table 1
Diagnostic criteria of occipital neuralgia according to the IHS.

Diagnostic criteria for occipital neuralgia
Unilateral or Bilateral Pain fulfilling the next criteria:
- Pain is located in the distribution of the greater, lesser and/or third occipital nerves.
- Pain has two of the following three characteristics:
1.- Recurring in paroxysmal attacks lasting from a few seconds to minutes.
2.- Severe intensity.
3.- Shooting, Stabbing or Sharp in quality.
- Pain is associated with both of the following:
1.- Dysaesthesia and/or allodynia apparent during innocuous stimulation of the scalp and/or hair.
2.- Either or both of the following:
a) Tenderness over the affected nerve branches.
b) Trigger points at the emergence of the Greater Occipital Nerve or in the area of distribution of C2
- Not better accounted for by another diagnosis.

Data obtained from the criteria of the International Headache Society.

2. Methods

We performed a retrospective chart review of all 26 subjects diagnosed with occipital neuralgia from January 2014 when our treatment algorithm started to be used in our institution and obtained an 18 subjects case series with follow ups of 6 months and more who underwent our treatment algorithm for Occipital neuralgia.

2.1. Patient selection

Starting in January 2014 all patients that were diagnosed with occipital neuralgia under the IHS classification comprising the next clinical features (Table 1) were enrolled to our algorithm for occipital neuralgia treatment (Fig. 1).

2.2. Treatment algorithm

After being diagnosed clinically as occipital neuralgia, all patients underwent the treatment algorithm, in which as a mean of confirmation of the neuralgia and as a treatment method they were offered a local injection with ropivacaine and dexamethasone, patients were required to sign an informed consent in order to obtain the injection, if they refused they were treated medically only with option to receive the injection if they ultimately decided to sign the consent.

Table 2
Barrow Neurological Institute Pain Score.

Score	Pain description
I	No pain, no medications
II	Occasional pain, no medications required
III	Some pain, adequately controlled with medications
IV	Some pain, not adequately controlled with medications
V	Severe pain or no pain relief

26 patients were identified with occipital neuralgia, all patients signed the consent and underwent the local injection first and 22 underwent microsurgical decompression and neurectomy, however we reduced our case series to 18 due to incomplete follow-up in 4 cases.

All cases received evaluation using the Barrow Neurological Institute Pain Score (BNIPS) (Table 2) in order to evaluate the pain frequency and control as well as the Visual Analogue Scale (VAS) to evaluate pain intensity and clinical evaluation of sensitivity in the C2 dermatome.

2.3. Local injection

Once the side and affected nerves were identified, we injected either 1 or 2 points (this depended on the number of nerves affected, if it was only the GON, LON or both) in accordance to the Vital and Becser [10] previously reported technique, we used for injection a combination of ropivacaine 7.5% and dexamethasone 8 mg titrated at 1:1 ratio, for each point we injected 10 ml (Fig. 2).

After local injection patients were immediately discharged and came back for evaluation at 6 weeks, if the improvement on VAS and BNIPS was more than 50% then the patient was deemed as a good candidate for surgical decompression and neurectomy of the affected nerve and the surgery was offered, out of the 26 subjects, 22 accepted the surgical treatment immediately, the other 4 presented reduction in pain <50% and entered the algorithm for reevaluation and medical treatment and are currently being followed.

2.4. Surgical procedure

2.4.1. Patient positioning

The subjects were placed in a prone position with the head resting on a horseshoe adapter for the Mayfield headrest with a 45 degree flexion of the neck to provide better exposure of the cervical spinous processes and theinion to locate the superficial landmarks, the thorax is

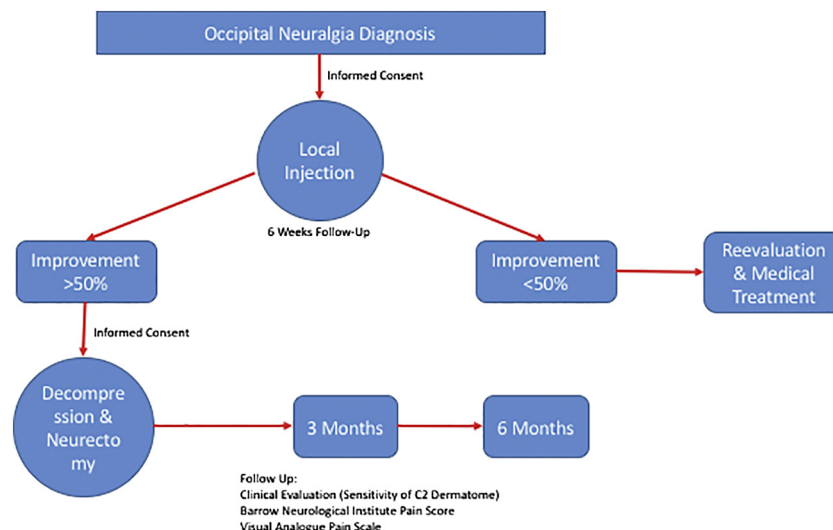


Fig. 1. Pemex algorithm for occipital neuralgia treatment.

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