



Occipital Neuralgia: A Review

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Abstract

Headache is the most common complaint everyone experiences in a lifetime regardless of age, sex and race. Most of the times it is managed with rest, assurance and simple analgesics. But persistent headache can be a symptom of serious ongoing medical problem like hypertension, sign of stress, anxiety or psychiatric disorders. It is important and necessary to seek medical checkup and advice if the frequency of headache increases; it becomes more persistent, severe and if associated with neck stiffness or neurological symptoms. There are different causes of headache like sinus headache, migraine, cluster headache, tension headache and headaches associated with trauma or intracranial pathologies. Spondylitis in the cervical spine can also result in neck pain and headache. Occipital neuralgia is one of the causes of headache due to inflammation or injury to the occipital nerves that runs through the scalp resulting in pain over occipital region and neck. It presents with severe paroxysms of burning; shock like pain in the distribution of occipital nerves and often confused with other causes of headache syndromes like migraine or cluster headache. Nerve blocks using local anesthetics are used if no response to conservative treatment.

Keywords: Headache; Occipital neuralgia; Occipital nerve block

Introduction

According to International Headache Society (IHS), headache is categorized as primary when they are not caused by another condition or secondary when there is underlying cause. Headache can be unilateral, bilateral or can radiate across the head. It can present with dull, throbbing or sharp character and may last from hours to many days [1].

Primary headaches: The common causes are

1. Migraine
2. Cluster headaches
3. Tension headaches

Secondary headaches: Headache can occur due to following reasons

1. Dehydration, carbon monoxide poisoning, alcohol abuse, associated with viral fever and dental pain.
2. Intracranial pathologies like concussion, stroke, brain tumor, meningitis or raised intracranial tension. Intracranial bleeds, ruptured aneurism causes thunderclap headache that needs urgent evaluation.
3. Psychiatric problems, overuse of headache medication-rebound headache.
4. Head/neck cancer.
5. Occipital neuralgia is a neuropathic pain condition due to nerve entrapment, whiplash injuries of the neck, tumor infiltration or following neurosurgery. Occasionally it is due to diabetes or inflammation of blood vessels. Occipital neuralgia: It is a condition

characterized by paroxysms of stabbing/shooting pain in suboccipital region that radiates over vertex in the dermatomes of nervus occipital major in 90% or minor in 10% and both in 8.7%. Mostly it is unilateral but can be bilateral and often difficult to differentiate from other headache syndromes. The greater occipital nerve (GON) receives sensory fibers from C2 and lesser occipital nerves from C2 and C3 nerve roots. It develops due to entrapment of the nerves in trapezius and semispinalis capitis muscles at the attachment to occipital bone. The cause of occipital neuralgia is thought to be due to irritation of occipital nerves due to injury, recurrent muscle spasm and entrapment of nerves in trapezius and semispinalis capitis or secondary to arthritis of cervical spine.

Symptoms and Signs

Presents with episodes of throbbing/stabbing/burning pain unilaterally or bilaterally in the back of head and neck, sometimes dull aches may be referred to the side of head or there can be dysaesthesia/parasthesia and pain on palpation of the scalp with muscle spasm and pain on neck movements. Patients may have migraine like symptoms of photophobia, phonophobia or radiation of pain on face like trigeminal neuralgia that needs to be differentiated by proper history and physical examination. Marked tenderness on pressure over the scalp reproducing typical pain is the diagnostic test to confirm occipital neuralgia. Neck pain needs to be differentiated from other causes of pain in neck like diseases of cervical disc, thyroid gland, lymph nodes, larynx/trachea or esophagus [2].

Investigations

Depending upon symptoms and signs diagnosis of headache can be confirmed on investigations like blood tests, X-rays of the neck and if required CT scan/MRI of brain. There are no specific tests to diagnose occipital neuralgia but once diagnosed on history and physical

examination a diagnostic occipital nerve block using local anesthetic at periphery or at C2/C3 roots are helpful to confirm the diagnosis.

Treatment

Rest, medication with serotonin receptor agonist, tricyclic antidepressants, antiepileptics and beta blockers are considered for primary causes of headache. Doctor's advice is necessary to prevent drug abuse or rebound headaches. Besides self-care, alternative approaches like meditation, hypnosis, acupuncture and herbal nutritional therapy can be considered. If medical management with analgesics, anticonvulsants and antidepressants fails then interventional therapy for occipital neuralgia are occipital nerve blocks using local anesthetic and steroids are considered. Chemical neurolysis with phenol/alcohol, radio-frequency (RF) ablation or cryoablation of occipital nerves is useful for long term effect. Other options are occipital nerve stimulation, rhizotomy or surgical intervention [3,4].

Applied Anatomy

The GON is formed by a branch of dorsal ramus of second cervical nerve that emerges between the posterior arch of atlas and the lamina of axis and by some fibres of third cervical nerve (Figure-1). It supplies medial portion of occipital scalp to the anterior portion of vertex. It runs inferior to the obliquus capitis inferior and divides into large medial and small lateral branches as motor supply to muscles of occipital region. Large medial branch later terminates as greater occipital nerve ascends over the dorsal surface of the rectus capitis posterior major muscle and turns dorsally to pierce semispinalis capitis then runs laterally deep into the trapezius muscle. The GON becomes subcutaneous just inferior to the superior nuchal line by passing above an aponeurotic sling which is composed of insertions of the trapezius and sternocleidomastoid muscles and lies just medial to the occipital artery.

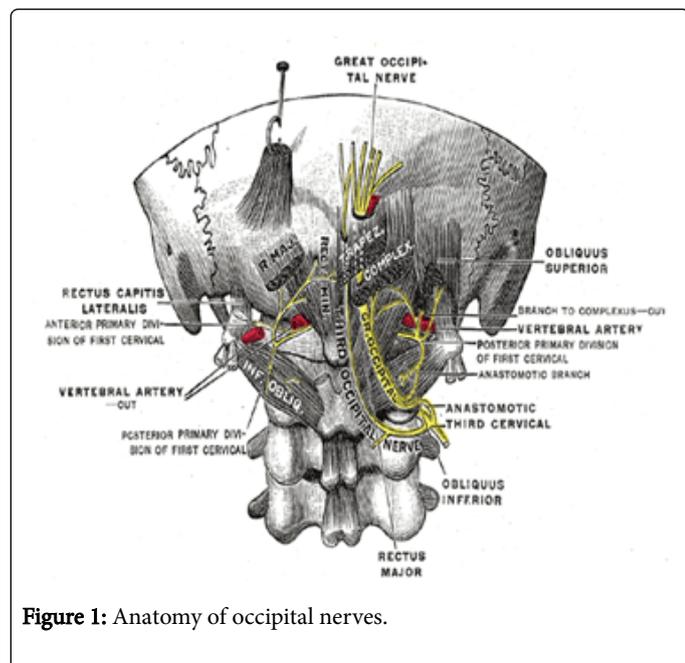


Figure 1: Anatomy of occipital nerves.

The lesser occipital nerve is formed by ventral rami of second and third cervical nerves and passes on posterior border of

sternocleidomastoid muscle and innervates the lateral portion of scalp and pinna of ear [5].

Technique of occipital nerve block

Patient is given an anxiolytic dose of diazepam or alprazolam in the night before block. Following informed consent, diagnostic local anesthetic nerve block of greater and lesser occipital nerve is performed. Patient is given either sitting position with head flexed or can be performed in lateral or prone position. A point is marked midway on the superior nuchal line and the mastoid process. The nerve exits approximately 3 cm below and 2.5 cm laterally from the occipital protuberance called asinion and runs medial to the occipital artery. Pulsation of the occipital artery is felt for identifying the nerve position. Maximum tenderness along the course of nerve is the best point of injection. Another point is marked 2.5 cm below and laterally to block the lesser occipital nerve (Figure-2).

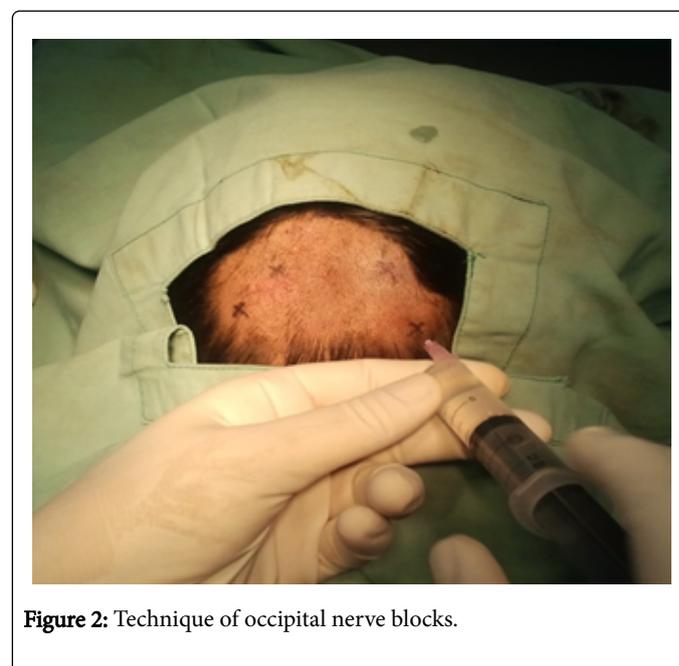


Figure 2: Technique of occipital nerve blocks.

It can be performed unilaterally or bilaterally. The procedure is performed inside the operation theatre with constant monitoring of the patient for vitals. Under aseptic precautions, with 27G two and half inch hypodermic needleskin infiltration of local anesthetic of 2% lignocaine 1 ml at each point is given. Then 22G hypodermic needle introduced just medial to the pulsations of the occipital artery until it hits the bone and paresthesia elicited. After -ve aspiration test for blood, 4-5 ml of bupivacaine 0.25% or lignocaine 2% is injected at both the point in fan shaped manner at first superiorly to block greater occipital nerve and then 4-5 ml laterally and inferiorly to block lesser occipital nerve. Methylprednisolone 40-80 mg or Triamcinolone 20-40 mg may be injected for long term effects. Recently, the use of ultrasound guidance for needle placement has been used.

Side Effects and Complications

As the occipital nerves are in close proximity of arteries accidental intravascular injections and toxicity reactions can occur. Careful injection of calculated safe local anesthetic dose after aspiration test is necessary. Post block high chances of hematoma formation at the site

of block can be tackled with application of manual pressure or cold packs at the site of injection. Post procedure numbness around the site of injections and mild ataxia due to loss of tonic neck reflex is usually temporary and some pain which is treated with oral anti-inflammatory analgesics for 3-5 days. In my experience of 23 cases with unilateral (17) and bilateral (6) with idiopathic origin (14), head injury (3), whiplash injury (2), previous neurosurgery (4) were the causative factors. We have used blind technique for Uni./bilateral occipital nerve blocks using local anesthetic and steroids. Upto three successive blocks required in 4 patients. Neurolysis was done in 3 cases using 1 ml of 8% Phenol [6].

Discussion

Occipital neuralgia also known as Arnold's neuralgia may resemble with migraine and other headache syndromes. The clinical diagnosis is based on symptoms and presence of dysaesthesia or pain on palpation/pressure over suboccipital region and relief with occipital nerve blocks. Detailed neurological evaluation is needed to detect intracranial pathologies. CT head and MRI cervical spine helps to rule out other causes of headaches and neck pain due to facet arthropathy, spondylosis etc. Association of dizziness, vertigo or hypertension with pain is known. The conservative management includes rest, physical therapy, local massage/ heat. Medication with antidepressants - Tricyclic antidepressant in combination with gabapentinoids-gabapentin/pregabalin or other anticonvulsants and anti-inflammatory/ analgesics may be helpful in some cases. If the pain persists, diagnostic/therapeutic occipital nerve block is required and often successful with conservative measures and stretching exercises.

Local anesthetic occipital nerve blocks are diagnostic and have short term therapeutic value. Series of several occipital nerve injections have proven useful in many forms of extracranial migraine, cervicogenic headache and cluster headache when combined with pharmacotherapy or physical therapy. Addition of Botulinum Toxin (botox) is found to relieve pain and muscle spasm for 4 months in patients with migraine and also reported to relieve other primary headache syndromes. It reduces the length, duration and severity of migraine so can also be a treatment option for occipital neuralgia [7,8]. Usually procedure is performed with blind technique by palpating occipital artery or paresthesia technique but fluoroscopy or ultrasound guidance may be useful to improve the precision of nerve block. Se HeeNa et al. studied the effect of occipital nerve blocks in 27 patients of cervicogenic headaches and found higher success rate (76.9% vs. 30.8%, $P < 0.05$).

In Doppler group as compared with control group [9-11]. For prolonged effect neurolysis of occipital nerves with alcohol/phenol in glycerine /omnipaque or dorsal root rhizotomy can be performed [12,13]. Currently, radiofrequency ablations of C2-C3 nerves is preferred over neurolysis. However denervation pain can develop with worst pain than before [14]. Pulsed radiofrequency of occipital nerves have promising results [15,16]. Ganglionectomy is more extensive procedure than rhizotomy, but observed to have short term pain relief of less than 3 months in 95% of patients in a study done by Acer et al [17]. Surgical decompression is an option for relief of resistant pain but more invasive procedure than rhizotomy and observed to have short term pain relief of less than 3 months. Ducic et al in his meta-analysis reported 86% success in patients who underwent surgical decompression [18]. Occipital nerve stimulation with implantable TENS has been studied for relief of pain with variable success and reported a complication like lead migration [19,20]. In the absence of

RF ablation which would have been safer, but costly option for our patients we offered alternative method of chemical neurolysis which is reported to have minimal risk of complications. In all our patients VAS Score decreased with each successive nerve block and following phenol neurolysis. Oral medications were tapered with complete relief from neuralgic pain that lasted for one year and not yet reported for recurrence of pain.

Conclusion

The occipital neuralgia is one of the causes of cervicogenic headache. The occipital nerve blockade is a simple, safe and effective method with minimal incidence of complications. Series of injections may be required for complete relief. The procedure can be performed by pain specialist as well as general practitioners. Use of fluoroscopy/ultrasound/ nerve stimulator reduce the risks and failure rate. Radiofrequency ablation, rhizotomy, occipital nerve stimulator implants are the newer modalities of treatment with better outcome.

Conflict of Interest

The author declares that there is no conflict of interest regarding the publication.

Source of Support

Nil

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References

1. Headache Classification Subcommittee of the International Headache Society (2004) The International Classification of Headache Disorders. (2nd edn), Cephalgia, London.
2. Taylor DC Occipital Neuralgia (Headache) Symptoms, Causes and Treatment for pain relief.
3. Hammond SR, Danta G (1978) Occipital neuralgia. Clin Exp Neurol 15: 258-270.
4. Afridi SK, Shields KG, Bhola R, Goadsby PJ (2006) Greater occipital nerve injection in primary headache syndromes-prolonged effects from a single injection. Pain 122: 126-129.
5. Waldman SD (2012) Occipital nerve block. Pain Management Injection Techniques. (3rd edn), Philadelphia, London, Toronto.
6. Kulkarni KR (2015) Bilateral occipital phenol neurolysis. International Journal of Anesthesiology & Pain Medicine.
7. Freund BJ, Schwartz M (2002) Use of botulinum toxin in chronic whiplash-associated disorder. Clin J Pain 18: S163-168.
8. Blumfeld AM, Dodick DW, Silberstein SD (2004) Botulinum neurotoxin for the treatment of migraine and other primary headache disorders. Dermatol Clin 22: 76-81.
9. Erdine S, Racz, Noe CE, Raj PP (1992) Somatic blocks: Head and Neck Interventional Pain Management: Image-Guided procedures.
10. Gray AT (2006) Ultrasound-guided regional anaesthesia: Current state of the art. Anaesthesiology 104: 368-373.
11. Na SH, Kim TW, Oh SY, Kweon TD, Yoon KB, et al. (2010) Ultrasonic doppler flowmeter-guided occipital nerve block. Korean J Anesthesiol 59: 394-397.

12. Bovim G, Fredriksen TA, Stolt-Nielsen A, Sjaastad O (1992) Neurolysis of the greater occipital nerve in cervicogenic headache. A follow up study. *Headache* 32: 175-179.
13. Ward JB (2003) Greater occipital nerve block. *Semin Neurol* 23: 59-62.
14. Hamer JF, Purath TA (2014) Response of cervicogenic headaches and occipital neuralgia to radiofrequency ablation of the C2 dorsal root ganglion and/or third occipital nerve. *Headache* 54: 500-510.
15. Huang JH, Galvagno SM Jr, Hameed M, Wilkinson I, Erdek MA, et al. (2012) Occipital nerve pulsed radiofrequency treatment: A multicenter study evaluating predictors of outcome. *Pain Med* 13: 489-497.
16. Vanelderden P, Rouwette T, De Vooght P, Puylaert M, Heylen R, et al. (2010) Pulsed radiofrequency for the treatment of occipital neuralgia: a prospective study with 6 months of follow-up. *RegAnesth Pain Med.* 35: 148-151.
17. Acer F, Miller J, Golshani KJ, Israel ZH, McCartney S, et al. (2008) Pain relief after cervical ganglionectomy(C2 and C3) for the treatment of medically intractable occipital neuralgia. *StereotactNeurosurg* 86:106-112.
18. Ducic I, Felder JM 3rd, Fantus SA (2014) A systematic review of peripheral nerve interventional treatments for chronic headaches. *AnnPlast Surg* 72: 439-445.
19. McGreevy K (2012) Updated perspectives on occipital nerve stimulator lead migration: Case report and literature review. *Clin JPain* 28: 814-818.
20. Weiner RL, Reed KL (1999) Peripheral neurostimulation for control of intractable occipital neuralgia. *Neuromodulation* 2: 217-221.