

SUPRAORBITAL AND AURICULOTEMPORAL NERVE ENTRAPMENT: A LESSER-KNOWN CAUSE OF HEADACHE MIMICKING MIGRAINE-LIKE SYMPTOMS.

Anuj Jung Rayamajhi^{1*}, Prajjwal Raj Bhattarai²

Affiliation

1. Associate Professor Department of Anesthesiology, Critical care and pain medicine, Civil Service Hospital, Nepal
2. Senior Consultant, Faculty (NBMS), Nepal Medicitim Nepal

ARTICLE INFO

Received : 09 June, 2023

Accepted : 27 July, 2023

Published : 10 November, 2023

© Authors retain copyright and grant the journal right of first publication with the work simultaneously licensed under Creative Commons Attribution License CC - BY 4.0 that allows others to share the work with an acknowledgment of the work's authorship and initial publication in this journal.



CR 56

DOI: <https://doi.org/10.3126/bjhs.v8i2.59863>

Corresponding Author

Dr Anuj Jung Rayamajhi

Associate Professor

Department of Anesthesiology Critical care and pain medicine

Civil Service Hospital, Nepal

Email: anujrayamajhi@gmail.com

ORCID ID : <https://orcid.org/0000-0002-0138-6502>

Citation

Supraorbital And Auriculotemporal Nerve Entrapment: A Lesser-Known Cause of headache mimicking Migraine-like Symptoms, Anuj Jung Rayamajhi, Prajjwal Raj Bhattarai. BJHS 2023;8(1)20.2070 - 2073.

ABSTRACT

Extracranial headaches, although not rare, can be a significant contributor to chronic headaches, affecting approximately 4% of individuals. Among the potential causes of these headaches, entrapment neuropathy in the facial area is a prominent factor, with supraoptic nerve entrapment being a leading cause. The resulting pain typically manifests in the frontal forehead regions that are innervated by this nerve. Ultrasound-guided supraoptic nerve interventions serve a dual purpose, acting as both a diagnostic tool and a therapeutic measure, offering valuable benefits in managing this condition.

KEYWORDS

Supraorbital nerve entrapment, Headaches, Neuropathic pain, Migraines, Cluster headaches.

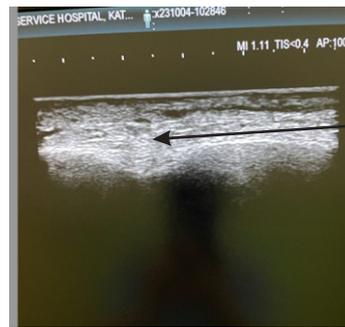


INTRODUCTION

Supraorbital nerve (SON) and auriculotemporal nerve (ATN) entrapment is a relatively uncommon cause of extracranial headache, as first described by Beyer in 1949.(1) SON & ATN entrapment occurs with an incidence of 4% & 0.4% and is characterized by pain in the nerve's territory and tenderness in the Supraorbital notch.(2,3) It can however, present with atypical manifestations that can mimic migraines and may lead to difficulty when differentiating them from other types of headaches. Nerve block and hydrodissection using local anesthetics can aid in diagnosing the entrapment. (2,4). We report a case in which we successfully diagnosed SON entrapment through the utilization of ultrasound-guided SON blockade and hydrodissection.

CASE -1

A 41-year-old gentleman presented to our pain clinic with a four-year history of headaches, NRS of 8, localized in the frontal region. The patient consistently experienced headaches starting at approximately 1 pm, which would progressively worsen throughout the night. The patient had been experiencing a consistent pattern of pain with similar characteristics. He described the pain as dull in nature, without any neuropathic characteristics such as electric shock-like sensations. Previous evaluations included visits to an ENT specialist and sinusitis treatment, but no improvement was observed. A neuro physician consultation was conducted, and an MRI brain scan yielded normal results. Upon examination, Tinels's test was negative, suggesting no signs of nerve irritation. The patient was provisionally diagnosed with migraine although the fixed time initiation of symptoms raised doubts, and, treated for migraines but no observed benefits in relieving symptoms were noted. Considering the possibility of nerve entrapment, we planned a diagnostic supraorbital nerve under ultrasound guidance. By placing the hockey stick probe (Fujifilm ARIETTA 750 3-15 HZ) horizontally across the supraorbital notch and directly visualizing the supraorbital foramen, we injected 1 ml of a mixture of 0.5% bupivacaine and Dexona 2 mg avoiding inadvertent injection into the orbital foramen (Fig 1 ultrasound image). We reevaluated the patient on day 4 then day 10, when he reported a significant reduction in pain, with a Numeric Rating Scale (NRS) score of 1 on both days. Based on the positive response to the nerve block, a diagnosis of supraorbital nerve entrapment was made. We achieved both advantages in our case.

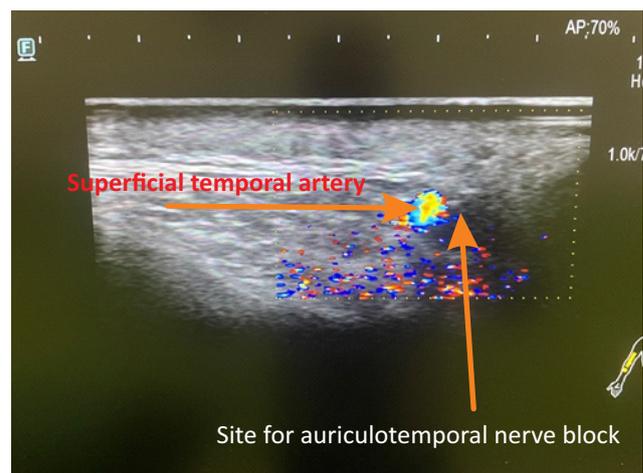


USG image showing supra orbital foramen and nerve block

CASE-2

A 35 year lady presented to our pain clinic with complain of electric shock like pain in left temporal region since 7 days. For same region she had visited emergency last night where codopar was prescribed and advised to visit medicine OPD. Patient directly visited pain clinic. On history pain started suddenly and severe in nature. Pain was received for 2-3 hours after having codopar. Tinel's test was not positive which may be due to codopar.

Unilateral temporal, sudden onset and electric shock like pain suggesting entrapment pain and diagnostic block was planned. 0.5% Bupivacaine 2 ml under ultrasound guidance (Fujifilm ARIETTA 750, Hockey stick probe 3-15 HZ) was injected posterior to temporal artery at the level of tragus. 5 mins after injection there was swelling like feeling around ATN and even eye lids. Patient was informed to note duration on analgesia and to take codopar after onset of pain. On next visit she has slight pain but need not take codopar. We plan for non invasive Pulse Radiofrequency stimulation which was third day of injection. On third day patient was comfortable and pain was decreasing so procedure was abandoned.



USG image for auriculotemporal nerve block, color doppler showing superficial temporal artery

DISCUSSION

In this case, we observed that the patient didn't have classical symptoms that were consistent with commonly known causes of headaches as migraines, cluster or tension headaches. The symptoms were neither associated with chronic neuropathies like trigeminal neuralgia nor did they resemble infectious pain akin to postherpetic neuralgia. Patient had undergone multiple sets of investigations and treatments trials without experiencing any improvement. We made a decision to administer nerve Blockade, despite the fact that we didn't find features of neuropathic pain.

Administering a few milliliters of local anesthetic in the affected side can bring relief or complete resolution of symptoms if the condition is attributed solely to nerve entrapment. The use of this nerve blockade offers two advantages. Firstly, it can serve as a diagnostic tool by confirming the diagnosis if the symptoms are alleviated. Secondly, it presents a therapeutic option to include in the treatment plan.⁶

Supraorbital nerve, a large lateral sensory branch of the frontal nerve, arises at supraorbital notch along the superior rim of the frontal bone anteriorly. The frontal nerve, a branch of the ophthalmic nerve, enters the orbit through superior orbital fissures. The frontal nerve also gives rise to medial small supratrochlear nerves that exit in the notch. Both nerves travel in vicinity to their arteries and supply sensory innervation to the forehead, upper eyelid, and anterior scalp. (Fig 2) The most common cause of supra optic neuralgia is compressed acutely at supraorbital notch. In the majority of cases, both noticeable and subtle trauma have been identified as contributing factors to compression. The differential diagnosis are ophthalmic(V1) trigeminal neuralgia, supratrochlear neuralgia, external compression headache, primary stabbing headache, hemicrania continua, nummular headache etc.⁶

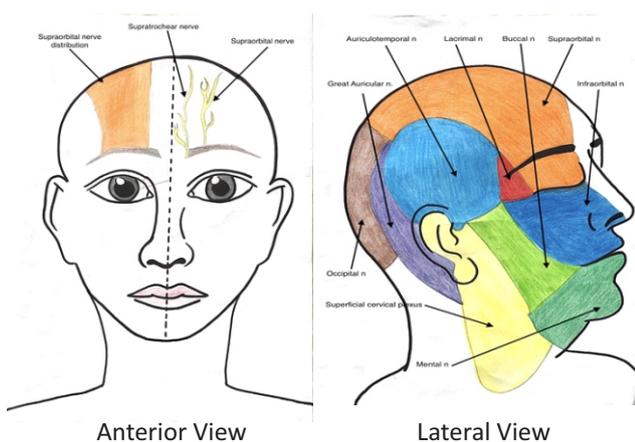


Figure 2: Sensory Distribution of nerves in the face.

Auriculotemporal nerve is sensory branch of mandibular nerve supplying temporomandibular joint, parotid region, ear and lateral scalp. Auriculotemporal neuralgia is more common among women: 85.3% of the cohort in Damarjran et al.'s study.^{4,11}

The following criteria are used to diagnosed supraorbital neuralgia according to the 2nd edition of the International Classification of Headache Disorders (ICHD-2):⁷. Auriculotemporal neuralgia is not individually mentioned but trigeminal nerve is included in ICHD.¹¹

1. Presence of paroxysmal or constant pain in the specific area of the forehead supplied by the supraorbital nerve, extending from the supraorbital notch to the medial aspect of the forehead.
2. The supraorbital nerve exhibits tenderness when pressure is applied at the supraorbital notch.
3. Relief from pain occurs when the supraorbital nerve is blocked with local anesthesia or when it undergoes ablation.

These criteria serve as a diagnostic tool for identifying supraorbital neuralgia in individuals presenting with typical symptoms. Supraorbital neuralgia is now categorized as a cranial neuropathy in the International Classification of Diseases 11th Revision (ICD-11)⁹. In cases where individuals do not meet all three criteria, a supraorbital nerve block can be performed to aid in the diagnosis. The procedure is generally safe and does not carry significant complications.

There are several treatment options available for addressing the nerve entrapment. The initial course of action in treatment of nerve entrapment involves the use of oral medications such as carbamazepine, gabapentin, and pregabalin. Additionally, an ultrasound-guided nerve block can be administered using local anesthetics, with or without the inclusion of glucocorticoid. This technique aims to relieve pain by blocking the nerve and utilizing hydrodissection to alleviate discomfort. Chemical neurolysis is also considered as a potential treatment, and surgical resection of the supraorbital nerve may be pursued in certain cases. Cryoneuroablation, a technique that uses extreme cold to disrupt nerve function, is another available option. Additionally, radiofrequency thermocoagulation can be employed as a treatment method. For those seeking non-destructive procedures, surgical decompression of the supraorbital nerve or pulsed radiofrequency therapy may be recommended.⁽¹⁰⁾ To accurately diagnose various types of entrapment neuropathy, it is crucial to maintain a high level of suspicion. These neuropathies occur as a result of chronic compression, affecting the peripheral nerves and causing symptoms like pain and impaired motor or sensory function. Compression or entrapment of nerves is not limited to the extremities; the nerves in the trunk, head, and neck are also susceptible to such conditions. The compression commonly occurs when a nerve traverses through narrower foramina or spaces, leading to potential nerve impingement or entrapment. This can result in various symptoms and functional impairments associated with nerve compression in the dermatomes supplied by the

affected nerve. We concluded that the case involved a frontal headache caused by supraorbital nerve neuralgia, which was successfully managed through hydrodissection release.

ACKNOWLEDGEMENT

Presika Pradhan for drawing figures.

FUNDING

None

CONFLICT OF INTEREST

None

REFERENCES

1. Beyer TE. Idiopathic supraorbital neuralgia. *Laryngoscope*. [https://doi.org/1949;59\(11\):1273-5](https://doi.org/1949;59(11):1273-5)
2. Justiz, R., Trescot, A.M. (2016). Supraorbital Nerve Entrapment. In: Trescot, A.M. (eds) *Peripheral Nerve Entrapments*. Springer, Cham. https://doi.org/10.1007/978-3-319-27482-9_14.
3. Juliana Stuginski-Barbosa, Rafael Akira Murayama. Refractory facial pain attributed to auriculotemporal neuralgia *J Headache Pain*. 2012 Jul; 13(5): 415-417. doi: 10.1007/s10194-012-0439-4.
4. Speciali, J.G., Gonçalves, D.A.G. Auriculotemporal neuralgia. *Current Science Inc* 9, 277-280 (2005). <https://doi.org/10.1007/s11916-005-0037-0>.
5. Trescot, A.M., Rawner, E. (2016). Auriculotemporal Nerve Entrapment. In: Trescot, A.M. (eds) *Peripheral Nerve Entrapments*. Springer, Cham. https://doi.org/10.1007/978-3-319-27482-9_15
6. Pareja, J.A., Caminero, A.B. Supraorbital neuralgia. *Current Science Inc* 10, 302-305 (2006). <https://doi.org/10.1007/s11916-006-0036-9>
7. Arnold M. Headache classification committee of the International Headache Society (IHS) the international classification of headache disorders, 2nd edition. *Cephalalgia*. 2004;24(Suppl. 1):1-160.
8. Arnold M. Headache classification committee of the International Headache Society (IHS) the international classification of headache disorders, 3rd edition. *Cephalalgia*. 2018;38(1):1-211. <https://doi.org/10.1177/0333102417738202>
9. World Health Organization. International statistical classification of diseases and related health problems (11th Revision). <https://icd.who.int/browse11/l-m/en>. Published 2018. Accessed 2019.
10. Ren H, Shen Y, Luo F. Treatment of Supraorbital Neuralgia Using Ultrasound-Guided Radiofrequency Thermocoagulation of the Supraorbital Nerve: A Retrospective Study. *J Pain Res*. 2020 Jan 29;13:251-259. <https://doi.org/10.2147/JPR.S228720>. PMID: 32099449; PMCID: PMC6996227.
11. M. Ruiz, J. Porta-Etessam, S. Garcia-Ptacek, C. de la Cruz, M.L. Cuadrado, A.L. Guerrero, Auriculotemporal Neuralgia: Eight New Cases Report, *Pain Medicine*, Volume 17, Issue 9, September 2016, Pages 1744-1748, <https://doi.org/10.1093/pm/pnw016>