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Case Series

Anaesthesia Section

Role of Supratrochlear and Supraorbital Nerve Block in Chronic Atypical Facial Pain Management: A Case Series

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ABSTRACT

Chronic Atypical Facial Pain (CAFP) presents a daunting clinical challenge, characterised by persistent, unexplained facial pain that is resistant to conventional treatments. It poses a significant challenge to both patients and healthcare providers due to its poorly understood aetiologies and resistance to traditional analgesic therapies. As a result, novel approaches are sought to alleviate the suffering of affected individuals. Supratrochlear and supraorbital nerve blocks have emerged as promising interventions for CAFP. These nerve blocks target the supratrochlear and supraorbital nerves, which are branches of the ophthalmic division of the trigeminal nerve. These nerves are frequently implicated in the generation and propagation of facial pain. By interrupting the transmission of pain signals along these nerves, supratrochlear and supraorbital nerve blocks offer a targeted and minimally invasive approach to managing CAFP. Furthermore, their relatively low risk profile makes them an attractive option for individuals who have not responded well to other treatments or who wish to avoid more invasive interventions. The present case series (three males and one female) discusses the anatomical considerations, technique, and potential complications associated with supratrochlear and supraorbital nerve blocks. It also reviews the current body of evidence supporting their use in CAFP management, including outcomes such as pain reduction and improved quality of life. Supratrochlear and supraorbital nerve blocks represent a valuable addition to the armamentarium of therapies available for the management of CAFP.

Keywords: Atypical facial pain, Chronic facial pain, Trigeminal nerve

INTRODUCTION

The intricacies of chronic atypical facial pain lie in its elusive aetiology, making it a source of frustration for both patients and clinicians. It leads to significant limitations in daily activities, causing psychological, social, and economic burdens. Its diagnosis primarily relies on the absence of identifiable pathology, leading to the classification of pain as "atypical" [1,2]. Consequently, conventional treatment modalities, such as medications and physical therapies, often fall short in providing adequate relief. This treatment gap necessitates a fresh perspective and novel approaches.

Supraorbital and supratrochlear nerve blocks offer a unique and minimally invasive intervention to address the persistent facial pain experienced by CAFP patients. These nerve blocks target specific branches of the trigeminal nerve, specifically the ophthalmic division, which plays a pivotal role in facial sensation. By interrupting pain signals along these neural pathways, these interventions have shown promise in providing significant pain relief for individuals struggling with CAFP, notably in the ophthalmic region [3,4].

This exploration into the role of supraorbital and supratrochlear nerve blocks in the management of CAFP seeks to shed light on their potential as a valuable tools in the armamentarium of therapies for conditions like trigeminal neuralgia, postherpetic neuralgia, migraine, cluster headache, and neuralgia (supratrochlear or supraorbital). Furthermore, relief with diagnostic blocks can pave the way for radiofrequency ablation for long-term relief in such conditions [5-8].

CASE SERIES

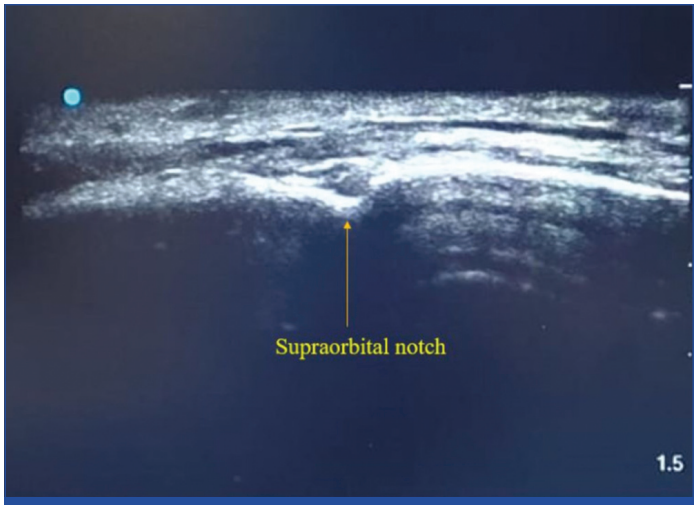
The included cases involve supratrochlear and supraorbital nerve blocks for chronic refractory forehead and periorbital pain in different scenarios. All the patients had already undergone conservative management, including a gradual increase in analgesics, steroids, and antineuropathic drugs, without significant pain relief. The patients were briefed about the procedure and its implications, and written informed consent was obtained before performing the procedure. After the procedure, the patients reported significant relief in pain scores, and no procedural or postprocedural complications or discomfort were observed. They provided consent for sharing their experiences in academic journals. Details of the cases are summarised in [Table/Fig-1]. Institutional Ethics Committee approval was obtained. Excluded cases included patients with sepsis and coagulopathy. The supratrochlear and supraorbital nerve block was performed under ultrasound guidance [9].

Variables	Case 1	Case 2	Case 3	Case 4
Age (years)	45	36	30	55
Sex	Male	Male	Female	Male
Diagnosis	Trigeminal neuralgia	Haemodialysis eye pain	Migraine	Post herpetic neuralgia
Duration	2 years	6 months	8 months	9 months
Side	Right	Left	Left	Left
Location	Forehead	Eye/forehead	Forehead	Forehead
Character	Sharp shooting, lancinating	Excruciating pain which was associated with pin prick and shock like sensation	Excruciating, throbbing	Excruciating, burning pain
VAS*	10/10	10/10 during attacks and 6/10 in between	8/10 during attacks	7/10
Frequency of episodes	1-2 episodes per day	During haemodialysis, each episode lasting 4-6 hours	>15 days/month, each episode for 8 hours	Continuous
Aggravating factors	No specific	-	Weather changes, stress, and menstruation	Touching
Associated symptoms and signs	-	Blurring of vision	Nausea, vomiting preceded by aura	Allodynia

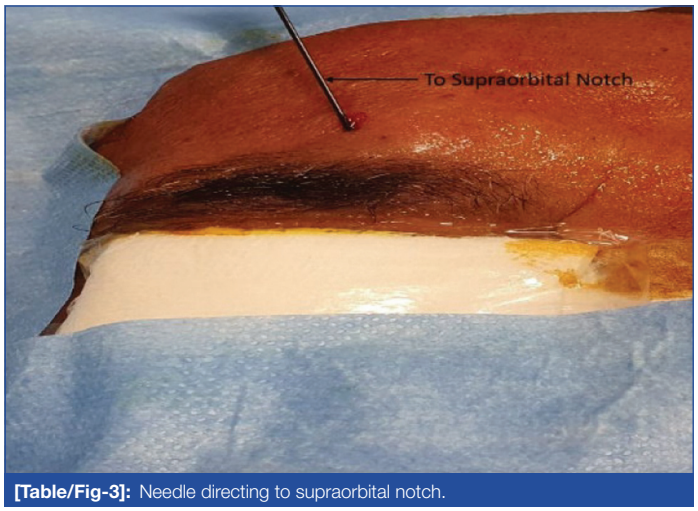
Pre-procedural VAS	10/10	10/10	8/10	7/10
Post-procedural VAS	0/10	2/10	1/10	2/10
Duration of relief	36 hours	24 hours	Next episode 4 days later	7 days
Post-procedure complications	-	-	-	-

[Table/Fig-1]: Details of all cases.
*Visual analogue scale

Technique: After palpating the supraorbital foramen by following the orbital rim 2 cm from the midline, a linear high-frequency (5-6 Hz) transducer was placed over the medial one-third of the supraorbital margin, after locating the supraorbital notch [Table/Fig-2]. The needle was introduced over the superior edge of the eyebrow, directed medially and caudally. When the needle tip was near the supraorbital notch, after performing a test aspiration, 1 mL of preservative-free lidocaine 2% (Loxicard) was injected, creating a subcutaneous wheal [Table/Fig-3,4].



[Table/Fig-2]: Ultrasonographic visualisation of supraorbital notch.

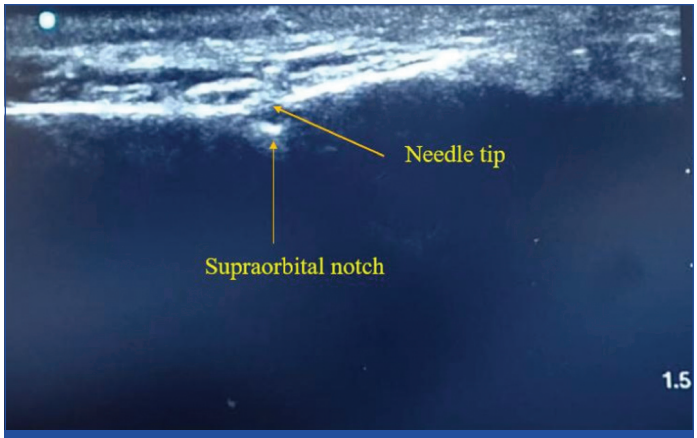


[Table/Fig-3]: Needle directing to supraorbital notch.

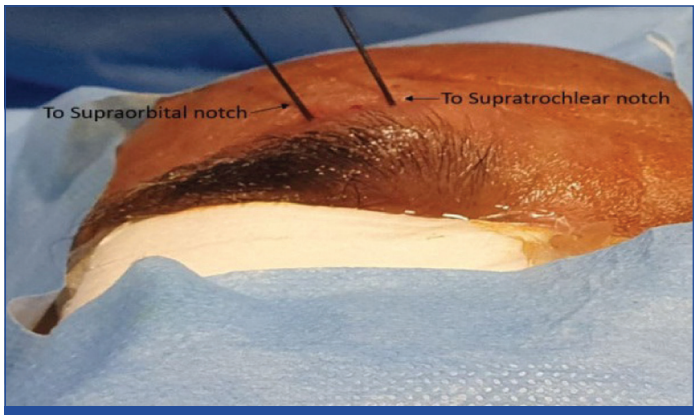
The supratrochlear nerve was blocked immediately following the supraorbital nerve block, using the landmark technique by directing the needle at the top of the angle formed by the eyebrow and the nasal spine. After performing a test aspiration, 1 mL of preservative-free lidocaine 2% (Loxicard) was injected [Table/Fig-5].

DISCUSSION

Supratrochlear and supraorbital nerve blocks are a part of the scalp block technique. First described for use during awake craniotomy,



[Table/Fig-4]: Ultrasonographic visualisation of needle tip at supraorbital notch.



[Table/Fig-5]: Needle directing to supraorbital and supratro chlear notch.

scalp blocks have been extensively used in neurosurgery to alleviate pain [10]. These blocks provide safe, prudent, and effective cranial analgesia that improves perioperative management of patients undergoing craniotomy, dermatological, and plastic surgery procedures on the forehead [11-13]. Additionally, these blocks have expanded their indications beyond the operation theatre in pain management, although mostly for conditions involving acute pain [14-16].

The frontal nerve, a branch of the ophthalmic division of the trigeminal nerve, divides into the supratrochlear nerve, which supplies the medial upper lid, conjunctiva, forehead, scalp, and frontal sinuses, and the supraorbital nerve, which provides sensory innervation to the conjunctiva, medial upper lid, forehead, and side of the nose. The supraorbital nerve courses anteriorly above the levator palpebrae superioris and exits the orbit through the supraorbital foramen in the superior margin of the orbit. It exits the orbit laterally to the supratrochlear nerve, which exits the orbit through the supratrochlear notch in the superomedial margin of the orbit [17]. The superficial distribution of both these nerves makes them an easy target for landmark and ultrasound techniques without significant adverse effects. The procedure is generally well-tolerated and can be performed in an outpatient setting. Due to its simplicity, it carries a low risk of complications. Potential risks include mild discomfort during the injection, bleeding, nerve injury, neuropraxia, localised swelling, periorbital ecchymosis, or infection at the injection site, although such complications are rare [3]. Patients should be carefully screened for contraindications such as coagulopathy and sepsis, and the procedure should be performed by skilled practitioners to ensure safety.

Govindappagari S et al., performed peripheral nerve blocks, including supratrochlear and supraorbital nerve blocks, in pregnant patients with migraines successfully, providing relief for a few days [18]. Ilhan Alp S and Alp R found that injecting 1% lidocaine into the supraorbital and infraorbital nerves three times over three days

significantly prevented acute migraine attacks during a six-month follow-up period without notable adverse effects [5]. Similarly, in the present case series, the patient experienced severe debilitating migraine attacks unresponsive to conservative management. After receiving the supraorbital and supratrochlear nerve blocks, the patient had significant pain relief that lasted for four days.

Eker HE et al., performed supraorbital and supratrochlear nerve blocks using the modified Van Lint technique in two cases of acute zoster, resulting in significant pain relief post-procedure [19]. Yamanaka D et al., successfully treated neuropathic complaints of post herpetic itch refractory to medical management with a supraorbital nerve block, providing a long-term pain relief [7]. Similarly, in present case, the patient experienced severe refractory burning pain associated with allodynia. After receiving the supraorbital and supratrochlear nerve block, the patient had notable pain relief for seven days.

In a retrospective case series by Perioff MD and Chung JS, they found rapid and sustained pain relief in patients with refractory trigeminal neuralgia using peripheral trigeminal nerve blocks [20]. Similarly, in this case, the patient had trigeminal neuralgia with lancinating pain in the forehead and experienced complete pain relief that lasted for 36 hours after receiving the supraorbital and supratrochlear nerve block.

Severe ocular pain, headaches, or hazy vision can occasionally occur during haemodialysis, leading to considerable morbidity for dialysis patients. This can happen due to various reasons, such as changes in intraocular pressure, blood pressure fluctuations, fluid shifts, or vascular access procedures. In this case, the patient experienced severe pain in the forehead region and around the eye that did not respond to conservative measures. There is a paucity of literature on interventional management of haemodialysis eye pain in refractory cases. Here, authors have described a novel and potential approach for managing eye pain with minimally invasive supraorbital nerve block, which provided substantial pain relief during the attack [21,22].

The role of supraorbital and supratrochlear nerve blocks in the management of chronic Cluster-like Facial Pain (CAFP) represents an innovative and promising approach to addressing the persistent and often debilitating facial pain experienced by affected individuals. These blocks have shown significant benefits, including a considerable decrease in pain, an improvement in quality of life, and a reduced need for opioid drugs. Many patients report significant and immediate pain reduction, which can be especially helpful for those who have struggled with CAFP for a long time. The duration of pain alleviation may vary depending on the patient [18,20].

The prolonged pain-relieving effects of nerve blocks persist even after the membrane-stabilising anaesthetic effect of local anaesthesia subsides. Supraorbital nerve blockade is known to effectively block the harmful stimulus and inhibit the antidromic flow of substance P (a neuropeptide) and Calcitonin Gene-related Peptide (CGRP), both of which are present during pain to limit continuous trigeminal excitability. These chemicals act as axon reflex mediators, which are the underlying cause of perivascular neurogenic inflammation. By restoring the threshold response to nociceptor stimulation, local factors that would otherwise enhance vasodilation, extravasations, and the allogenic stimulation of these peptides are blocked [23,24].

CONCLUSION(S)

The treatment paradigm for atypical facial pain remains unclear when a patients fail conservative medical therapy, and they often consider more potent or invasive therapies, such as opioids and surgeries. Peripheral nerve blocks, which are easy and safe, can provide extended pain relief before resorting to opioids or more invasive procedures at the ganglion level, and they can also pave the way for radiofrequency ablation of the same nerves. In present case series, patients achieved rapid and significant pain relief with supraorbital and supratrochlear nerve blocks. While further research is needed to refine protocols, identify patient selection criteria, and optimise long-term outcomes, these nerve blocks offer a promising avenue for providing relief to individuals burdened by the complexities of atypical facial pain. Their role in comprehensive pain management strategies should be considered and explored to enhance the well-being of patients facing this challenging condition. Therefore, this modality should be considered as a potential diagnostic and therapeutic option for atypical facial pain.

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