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CASE REPORT

A Shot at Relief: A Case Series on Infraorbital Nerve Block for Intractable Trigeminal Neuralgia in the ED

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ABSTRACT

Trigeminal neuralgia (TN) is a debilitating facial pain syndrome that is often difficult to manage with standard treatments. Although specific regional anaesthesia techniques are available, they are rarely practised in the Emergency Department (ED). We discuss three cases of patients with severe, intractable TN pain unresponsive to oral medications, where an infraorbital nerve block (IONB) was performed for pain relief. IONB using an intraoral (classical) approach, a 30-gauge needle was inserted at the infraorbital foramen after antiseptic preparation, and 1 mL of 2% lignocaine combined with 1.5 mL of 0.5% bupivacaine was administered. All three patients experienced immediate pain relief, and no immediate adverse effects were observed. Follow-up over six months showed that two out of three patients had long-lasting pain relief, supporting the potential of IONB using local anaesthetics as a viable intervention for sustained pain relief. This case series highlights the effectiveness of IONB as an alternative treatment for trigeminal neuralgia in patients who do not respond adequately to conventional pharmacologic therapies in the emergency setting.

KEYWORDS

• Infraorbital nerve block • Refractory trigeminal neuralgia • Peripheral nerve blocks

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INTRODUCTION

Trigeminal neuralgia is a debilitating facial pain syndrome characterized by intense, sharp, or burning pain, often likened to a stinging sensation.[1] This condition is diagnosed clinically based on the International Classification of Headache Disorders (ICHD) defined criteria.[2] It has an incidence of 4-5/100,000 in the population, reflecting its rarity in clinical practice.[3] Although many patients with TN are managed effectively with pharmacological treatments, a subset requires surgical or neurolytic interventions when medication alone proves insufficient.[1]

It is uncommon for patients with TN to present to the ED, as they typically attend scheduled pain clinic appointments. However, when TN pain becomes excruciating and unmanageable, patients may seek emergency care, creating a unique challenge for ED physicians. These patients are often already on high doses of oral painkillers, and intravenous analgesics or opioids may provide limited relief due to the neuropathic nature of their pain.[4] Consequently, proficiency in peripheral nerve blocks becomes crucial for emergency physicians, as these interventions can provide significant relief for TN when conventional analgesics fall short.

Previous studies have demonstrated the efficacy of IONBs for TN, particularly when performed under ultrasound guidance, to enhance precision.[5,6] However, in many resource-limited emergency settings, ultrasound may not always be readily available, making performing an effective blind (landmark-based) IONB a valuable skill for emergency physicians.

This case series presents three instances in which infraorbital nerve blocks were successfully administered using a blind intraoral technique in the ED for patients with refractory TN. By demonstrating the efficacy and feasibility of this approach, our study highlights its potential role in the acute pain management of TN, particularly in settings where access to advanced imaging or specialized pain interventions may be limited.

METHODS

Study Design and Setting:

This retrospective case series was conducted in the Department of Emergency Medicine over one year (September 2023 to August 2024). The study included patients with trigeminal neuralgia who received infraorbital nerve blocks in the emergency department for pain management. Data collection and follow-up were performed per Institutional Ethics Committee guidelines, and informed written consent was obtained from all patients before data retrieval.

Patient Selection:

Patients were included if they met the following criteria:

- Age ≥18 years.
- Diagnosed case of trigeminal neuralgia.
- Unresponsive to standard pharmacologic management.
- Had not previously received a nerve block for TN in the ED.

Standard ED Treatment for Trigeminal Neuralgia:

In our ED, the standard treatment for TN consists of:

1. ***First-line pharmacologic therapy:*** Anti-convulsants (carbamazepine, gabapentin) and muscle relaxants
2. ***Rescue therapy for refractory cases:*** It includes the administration of intravenous NSAIDs (e.g., ketorolac) and opioids (e.g., tramadol, fentanyl) for patients who did not achieve adequate pain relief with first-line pharmacologic treatment.
3. IONB is not routinely used as first-line therapy but is considered in patients who fail to achieve adequate pain relief with medications

This study focuses on cases where IONB was used as an alternative pain management strategy due to inadequate response to pharmacologic treatment.

IONB (Classical or Intraoral approach) technique performed in ED:

1. Position the patient in a seated posture, ensuring that the plane formed by the biting surfaces of their upper teeth (maxillary occlusal plane) is tilted at a 45-degree angle.
2. Apply a topical anaesthetic to the gum line above the maxillary canine.

3. Identify the infraorbital foramen using anatomical landmarks. (Figure 1)
4. Retract the cheek and insert the needle into the mucosa above the second premolar.
5. Direct the needle superiorly towards the infraorbital foramen.
6. Aspirate to ensure the needle is not within a vessel.
7. Inject the anaesthetic into the space. (Figure 2)
8. Avoid injecting into the foramen by applying firm pressure on the infraorbital rim.

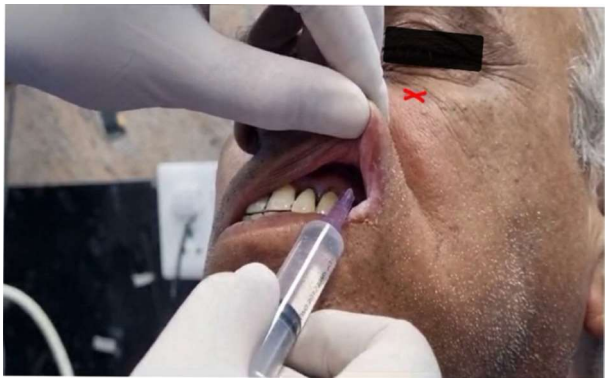

Figure 1: Anatomical Landmark for Infraorbital Foramen

The red mark on the patient's face highlights the anatomical location of the infraorbital foramen. This serves as the target site for the infraorbital nerve block.

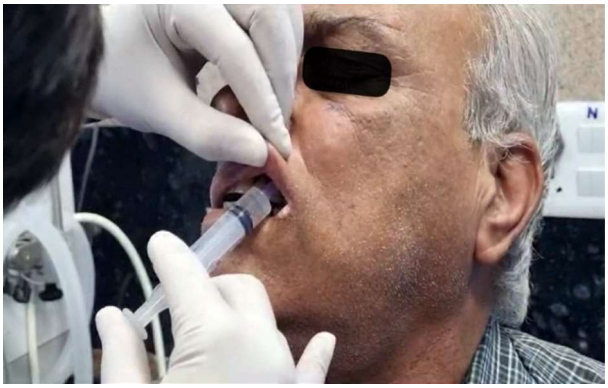

Figure 2: Administration of Local Anaesthetic for Infraorbital Nerve Block

The image demonstrates the infiltration of a local anaesthetic over the infraorbital foramen during an intraoral infraorbital nerve block procedure

Data Collection and Follow-up:

For each identified case, the following data were extracted from electronic medical records:

- Patient demographics (age, gender)
- TN history (previous episodes, prior treatments)
- ED presentation details (pain severity, response to pharmacologic therapy, indication for IONB)
- IONB procedural details (technique, anaesthetic used, immediate response)
- Pain relief at 30 minutes post-procedure
- Any complications

Follow-up data were collected via:

1. Electronic medical records review: Assessing for repeat ED visits related to TN within six months.
2. Telephonic follow-up: Conducted six months post-procedure to document pain recurrence and long-term relief.

Cases were included in the study only if complete follow-up data were available.

CASE REPORT

Case 1

A 61 yrs old male with a history of hypertension/ type 2 diabetes mellitus/ trigeminal neuralgia (V2>V3) for 8 years, who was taking tablet carbamazepine 400mg BD, tablet pregabalin 75 mg BD, tablet flexon 500mg BD, tablet etoricoxib 60mg OD/SOS for pain relief presented to ED with complaints of severe pain (Numeric Rating Scale (NRS)-10/10) over left side of face which increased on eating, swallowing, and closing mouth. There was accompanying pain in the forehead and mid-face, associated with lacrimation and conjunctival injection. On arrival, his vital signs were: blood pressure 142/86 mmHg, heart rate 88/min, respiratory rate 18/min and oxygen saturation 98% on room air. The primary survey was normal. Point-of-care investigations showed no electrolyte abnormalities on blood gas analysis, and the ECG showed a normal sinus rhythm.

Injection ketorolac 30 mg intravenous (IV) with tablet etoricoxib 60mg was given, and after 20 mins, there was no resolution of pain. Injection Fentanyl 50mcg IV was given, which showed no improvement after 30 mins(NRS-10/10). IONB was planned. IONB (2% lignocaine 1ml with 0.5% bupivacaine 1.5ml) was given using an intra-oral approach. After 10 minutes, the patient reported a 0/10 pain score (NRS). The patient was monitored

for 1 hrs for adverse reactions and discharged from the ED. The patient was followed up for 6 months, during which no further ED visits were recorded, and no recurrence of severe pain was reported.

Case 2

A 51-year-old female with a history of trigeminal neuralgia(V2>V3) for the last 5 years is on tablet pregabalin 75 mg BD, tablet clozapine 200 mg OD, tablet escitalopram 10 mg HS, tablet flexon 500 mg BD/SOS for pain relief presenting to ED with excruciating pain over the right side of the face (NRS-10/10) with burning/electrocuting sensation, the pain increased on talking, eating, and closing mouth and was radiating to right lower jaw. On arrival, her vital signs were: blood pressure 136/84 mmHg, heart rate 94/min, respiratory rate 18/min and oxygen saturation 97% on room air. Primary survey and point of care investigations were normal.

Injection ketorolac 30 mg IV with tablet etoricoxib 60mg was given, and after 30 mins, there was a slight resolution of pain (NRS -8/10). Injection tramadol 50 mg IV was given, and no improvement was observed after 30 mins. IONB was planned. IONB (2% lignocaine 1ml with 0.5% bupivacaine 1.5ml) was given using an intra-oral approach. After 10 minutes, the patient reported a 1/10 pain score (NRS). The patient was monitored for 1 hour for adverse reactions and discharged from the ED. The patient was followed up for 6 months. She experienced another episode one month later and was evaluated at the Pain Clinic, where she underwent IONB with phenol neurolysis.

Case 3

A 46-year-old male with a history of trigeminal neuralgia (V2) for the last 2 years who was taking tablet carbamazepine 200 mg TDS, tablet gabapentin 300 mg OD, tablet flexon 500 mg BD, tablet etoricoxib 60 mg SOS for pain relief presented to ED with excruciating pain over right side of face (NRS-10/10) with burning sensation, the pain increased on talking, blinking, and closing of mouth. On arrival, his vital signs were: blood pressure 130/82 mmHg, heart rate 90/min, respiratory rate 16/min and oxygen saturation 99% on room air. Primary survey and point of care investigations were normal.

Injection ketorolac 30 mg IV with tablet ecoricoxib 60mg was given, and after 30 mins, there was slight resolution of pain (NRS-9/10). Injection tramadol 50 mg IV was given, which showed some improvement after 30 mins (NRS-5/10), but the patient still complained of a sharp tingling sensation over the face. IONB was planned. IONB (2% lignocaine 1ml with 0.5% bupivacaine 1.5ml) was given using an intra-oral approach. After 10 minutes, the patient reported a 0/10 pain score (NRS). The patient was monitored for 1 hour for adverse reactions and discharged from the ED. The patient was followed up for 6 months, during which no further ED visits were recorded, and no recurrence of severe pain was reported.

DISCUSSION

The management of TN remains a considerable challenge. It is conventionally managed with pharmacologic agents, including anticonvulsants (such as carbamazepine, gabapentin) and muscle relaxants, even though, they were not originally developed for treating TN. Carbamazepine was studied in adequate placebo-controlled clinical trials in the 1960s and is still considered the most effective drug for TN. Among emerging treatment options currently under clinical investigation are local botulinum neurotoxin type A injections and a novel sodium channel blocker (CNV1014802) that selectively blocks the Na v1.7 sodium channel.[1] However, a subset of patients remains refractory to these treatments, necessitating the consideration of invasive procedures like nerve blocks. In this context, the infraorbital nerve block (IONB) emerges as a promising and underutilised technique, particularly in the emergency setting.

The infraorbital nerve, which provides sensory innervation to the lower eyelid, side of the nose, upper lip, upper incisors, canine, premolars, and the root of the first molar, is an accessible target for regional anaesthesia. (Figure 3) Its anatomical accessibility makes it a suitable target for regional anaesthesia in the ED, even by non-anaesthesiologist physicians with appropriate training. Our case series demonstrates that intraoral IONB provides rapid and substantial pain relief, with all three patients reporting a significant reduction in numeric rating scale (NRS) pain scores within 10–30 minutes of administration. (Table 1) This rapid onset of analgesia is crucial in emergency settings, where timely pain control improves patient satisfaction, decreases agitation, and

may reduce ED length of stay.[6] Importantly, the analgesic effect of IONB in our series was achieved without escalation to high-dose opioids, highlighting its opioid-sparing potential.

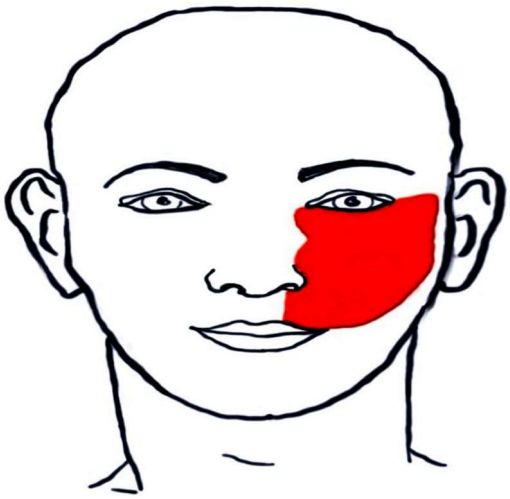

Figure 3: Area of Anaesthesia for Infraorbital Nerve Block
The highlighted red region represents the sensory distribution of the infraorbital nerve, which is effectively anesthetized during an infraorbital nerve block.

Furthermore, the follow-up data, extending to six months post-intervention, revealed that two of the three patients did not experience a recurrence of severe pain. This sustained analgesic effect suggests that IONB using local anaesthetics offers immediate relief and may contribute to longer-term pain management, potentially reducing the frequency of ED revisits and improving TN patients' overall quality of life.[1,5]

Notably, the procedures were well-tolerated, with no adverse reactions reported, highlighting the safety of IONB when performed by appropriately trained ED clinicians. Integrating nerve blocks into standard pain management protocols within the ED could represent a significant advancement in the treatment of refractory TN.[6]

Table 1: Clinical Characteristics, Pain Scores, and Outcomes Following Infraorbital Nerve Block in Patients with Trigeminal Neuralgia

Case No.	Age (yrs.)	Sex	Affected Side	TN Division	Initial Pain Score (NRS)	Pain Score after 10 min of IONB	Pre-IONB Analgesics Used	Post-IONB Outcome	Follow-up Outcome
1	61	Male	Left	V2>V3	10	0	Ketorolac, Etoricoxib, Fantanyl	Complete pain releaf	No recurrence at 6 months 1
2.	51	Female	Right	V2>V3	10	1	Ketrolac, Etoricoxib, Tramadol	Near-complete relief	1 recurrence. phenol neurolysis at pain clinic
3.	46	Male	Right	V2	10	0	Ketorolac, Etoricoxib, Tramadol	Complete pain relief	No recurrence at 6 months

CONCLUSION

Our findings support the utility of IONB as an effective alternative for patients with TN who are unresponsive to conventional pharmacologic treatments in an ED setting. Given the rapid onset of pain relief and the potential for sustained benefits, further studies with larger cohorts are warranted to validate these results and establish standardized guidelines for using IONB in the emergency management of TN.

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