

ULTRASOUND GUIDED PERIPHERAL NERVE BLOCK FOR TRIGEMINAL NEURALGIA: A CASE REPORT

Bambang Sulisty^{1*}, Wisnu Budi Pramono²

¹*Department of Anesthesiology, Dirgahayu Hospital, Samarinda, Indonesia*

²*Department of Anesthesiology, Faculty of Medicine, Jenderal Soedirman University*

ABSTRAK

Background: Trigeminal neuralgia (TN), also known as tic douloureux, is a severe neuropathic pain disorder characterized by recurrent unilateral facial pain. Although pharmacological therapy remains the first-line treatment, a significant proportion of patients experience inadequate pain control or adverse effects. Alternative minimally invasive approaches are therefore needed. Case Presentation: A 26-year-old woman presented with a one-year history of severe, paroxysmal, electric shock-like pain on the left side of her face, with a Visual Analog Scale (VAS) score of 6. The pain was triggered by daily activities such as talking, eating, and brushing teeth. Clinical and laboratory examinations showed no abnormalities, and the patient was diagnosed with trigeminal neuralgia. Pharmacological treatment with paracetamol and pregabalin provided only temporary relief. The patient declined invasive procedures targeting the trigeminal ganglion. Intervention and Outcome: The patient underwent ultrasound-guided peripheral nerve block targeting the supraorbital, infraorbital, and mental nerves using lidocaine and dexamethasone. Immediately after the procedure, the patient reported complete pain relief (VAS score 0). At 7 days follow-up, the patient discontinued medication without recurrence of symptoms. At 3 months follow-up, the patient remained pain-free. Conclusion: Ultrasound-guided peripheral nerve block may serve as an effective and minimally invasive alternative for managing trigeminal neuralgia, particularly in patients who do not respond to pharmacological therapy or refuse more invasive procedures.

Keywords : Trigeminal neuralgia, facial pain, peripheral nerve injection

Corresponding author:

Bambang Sulisty^o,

Department of Anesthesiology, Dirgahayu Hospital, Samarinda

Jl. Gunung Merbabu No. 62, Kelurahan Jawa, Samarinda Ulu, Kota Samarinda, Kalimantan Timur

Email: b.sulisty^o87@gmail.com

INTRODUCTION

Trigeminal neuralgia, commonly referred to as tic douloureux, is regarded as one of the most excruciating physical and mental ailments that a person can experience (Maikap

and Padhan, 2022). The trigeminal nerve, which transmits sensation from the face to the brain, is affected in this chronic pain disorder. Even slight facial stimulation, such as brushing teeth or applying cosmetics, may trigger sudden, severe pain episodes (Turton, 2019). Trigeminal neuralgia is clinically characterized by recurrent unilateral, brief electric shock-like pain limited to the distribution of one or more branches of the trigeminal nerve, as defined by the International Classification of Headache Disorders (ICHD-3). The condition significantly impairs quality of life and functional ability, often leading to psychological distress, including anxiety and depression.

At first, patients may experience short and mild episodes. However, trigeminal neuralgia can progress to more frequent and prolonged attacks of severe pain (Khawaja and Scrivani, 2023). Women are more commonly affected than men (American Medical Association, 2017). The global incidence of trigeminal neuralgia is estimated at 4–13 cases per 100,000 population per year, with increasing prevalence in older age groups. In Indonesia, epidemiological data remain limited, but cases are frequently encountered in clinical practice, indicating a need for effective and accessible management strategies.

Pain attacks in trigeminal neuralgia can occur repeatedly over days, weeks, or months, and in severe cases, may occur multiple times per day. The disease may also exhibit remission periods lasting months or years before recurring with greater intensity. Over time, remission intervals tend to shorten, and pain may evolve into a persistent background aching or burning sensation, with or without superimposed sharp attacks (Zakrzewska, 2021). First-line treatment typically includes pharmacological therapy such as carbamazepine or oxcarbazepine; however, not all patients respond adequately, and some experience significant side effects. In such cases, interventional approaches, including peripheral nerve block, may be considered as alternative or adjunctive therapy.

Ultrasound-guided peripheral nerve block has emerged as a minimally invasive technique that allows precise localization of target nerves, increasing efficacy while reducing complications compared to blind techniques. Despite its potential advantages, reports on its application in trigeminal neuralgia, particularly in resource-limited settings, remain limited (Hodaie, 2024). Therefore, this case report aims to describe a case of classical trigeminal neuralgia successfully managed with ultrasound-guided peripheral nerve block. This report is expected to contribute to the existing literature by highlighting the clinical effectiveness and feasibility of this technique as an alternative pain management strategy.

RESEARCH METHOD

Case Report

A 26-year-old woman's primary complaint was that she had been experiencing excruciating, piercing, electrical shock-like pain on the left side of her face for one year, lasting anywhere from seconds to minutes. The patient's VAS score was six, and the pain was brought on by chatting, eating, cleaning his face, and brushing his teeth. During the intraoral and extraoral examination, no pathology was found. The patient had no history of diabetes mellitus, high blood pressure, chronic heart disease, hepatitis, or any other chronic illness, and the radiological examination showed no abnormalities. There were no aberrant results from the hematology or plasma examination.

Patient had paracetamol 500 mg and pregabalin 75 mg once a day per oral. But if the medication was stopped one day, her pain recurred again with higher intensity. Patient refused minimal invasive procedure to trigeminal ganglion.

This patient was performed peripheral nerve block on nervus trigeminal branches. Patient was injected lidocain 1% 1cc and dexamethasone 2 mg (0,5cc) on supra orbital nerve, lidocain 1% 1cc and dexamethasone 2 mg (0,5cc) on infra orbital nerve and last lidocain 1% 2cc and dexamethasone 2 mg (0,5cc) on submental nerve. All of this procedure used ultrasonography guided to minimize sentinel incident.

After procedure, VAS was 0. Patient was observed 2 hours to prevent side effects of drugs. After 2 hours, patient was discharged from hospital. Pregabalin and paracetamol still consumed. Seven days after procedure, paracetamol and pegabalin were not used anymore because she not experienced pain again. Two weeks after procedure she had no pain. Three month after procedure, patient had no pain at her face. No data about 6 month after procedure because there was no communication with patient.



Figure 1. Patient's Ultrasonogram supraorbital nerve before injection.



Figure 2. Patient's Ultrasonogram infraorbital nerve before injection

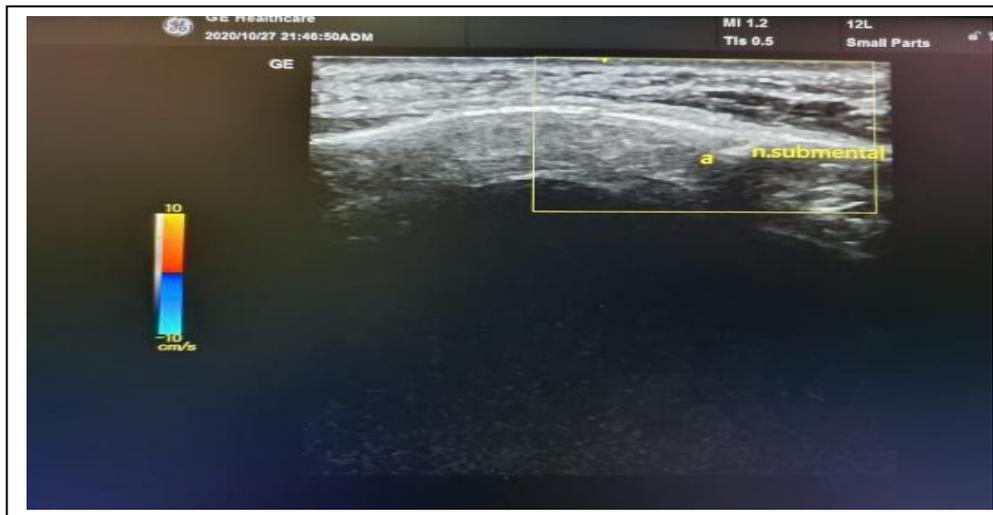


Figure 3. Patient's Ultrasonogram submental nerve before injection.

RESULT AND DISCUSSION

The three sensory branches of the trigeminal nerve are the mandibular (V3), maxillary (V2), and ophthalmic (V1). The ocular, supraciliar, frontal, and upper nasal areas are innervated by the V1 branch; the zygomatic, upper teeth, lateral nose, lower eyelid, and upper lip areas are innervated by the V2 branch; and the mandible and temporomandibular joint area are innervated by the V3 branch (Turton, 2019) (Zakrzewska, 2021). Van Kleef et al. state that the most frequently impacted branches are V2 and V3, with a rate of 32%, followed by the involvement of only V2 or all branches, with a prevalence of 17%. V1 is the branch that is least involved (4%). With an annual prevalence of 4.3 cases per 100,000 population, trigeminal neuralgia is the most prevalent cranial neuropathy. It is more common in women than in men (5.7 versus 2.5% per 100,000 inhabitants), and it is more common in older adults (11 instances per 100,000 over 75 years) (American Medical Association, 2017).

Recurrent paroxysms of unilateral facial pain limited to the trigeminal distribution, lasting between a fraction of a second and two minutes, severe in intensity with an electric shock-like shooting, stabbing, or sharp quality, and triggered by harmless stimuli are required by the International Classification of Headache Disorders, third edition (ICHD-3) criteria for TN (Turton, 2019).

Depending on the underlying etiology, trigeminal neuralgia can be further characterized as classical, secondary, or idiopathic (Dong and Lim, 2023). Trigeminal neurovascular compression with morphological abnormalities ipsilateral to the side of the pain, as shown either on MRI imaging with suitable trigeminal sequences or after surgery, is the hallmark of the classical type, which is the most prevalent and makes up 75% of cases. Since this is a typical neuroimaging finding in healthy individuals, simple trigeminal contact without morphological alterations is insufficient to support such a diagnosis.

According to prospective trigeminal MRI imaging studies, classical trigeminal neuralgia is linked to neurovascular compression and morphological alterations (distortion, indentation, and atrophy) on the symptomatic side, although these changes are uncommon on the asymptomatic side. About 15% of cases are of the secondary type, which is caused by a neurological condition that can be identified as the cause of trigeminal neuralgia (apart from trigeminal neurovascular compression). These conditions include multiple sclerosis, arteriovenous malformation, and cerebellopontine angle tumor. Trigeminal Neuralgia-like symptoms are seen in about 2% of many sclerosis patients. About 10% of instances are of the idiopathic kind, which is identified when there is no discernible explanation for trigeminal neuralgia. Depending on whether there is continuous or nearly continuous interictal pain, idiopathic and classical TN are further divided into groups with exclusively paroxysmal pain or with concurrent continuous pain (Lambru, 2021).

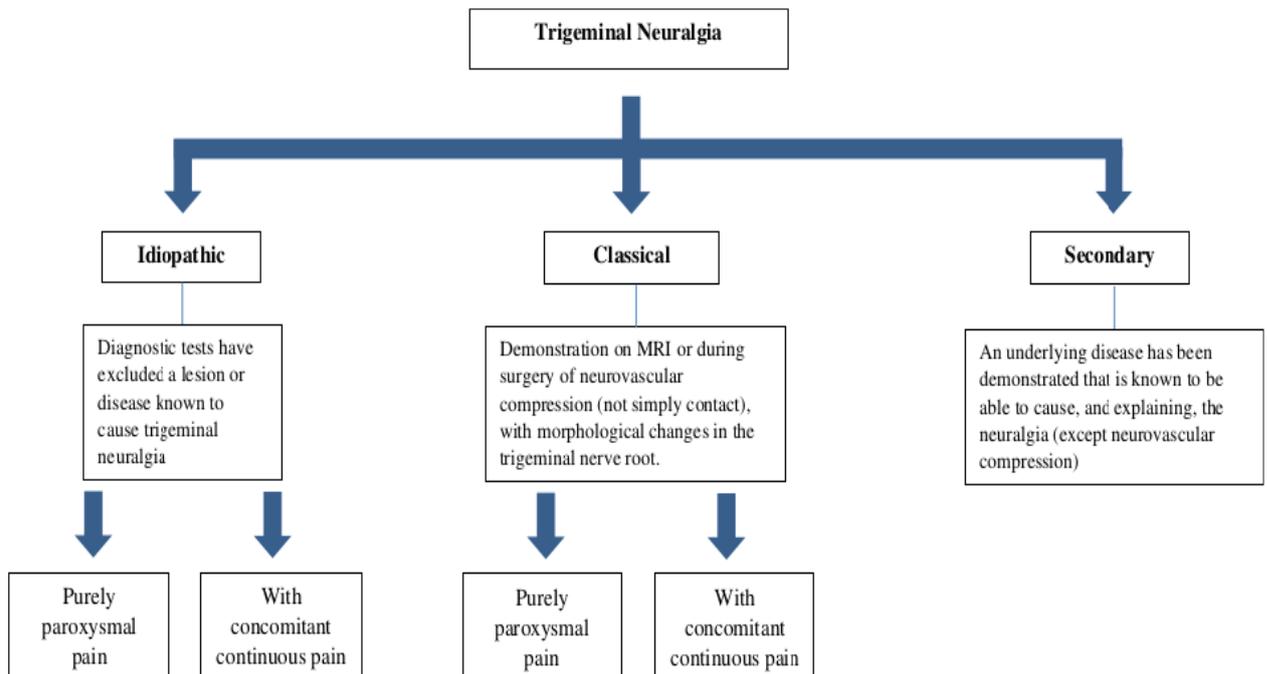


Figure 4. The Classification of Trigeminal Neuralgia

More damage is done to the right side of the face (60%) than the left. In individuals with TN, side-alternating unilateral pain paroxysms are more common than bilateral simultaneous pain, which is uncommon (1.7%–5%). Bilateral simultaneous or side-alternating trigeminal paroxysmal pains are uncommon and should be taken seriously as a sign of a neurological or non-neurological cranial illness. Therefore, it is necessary to carefully rule out secondary pathology. Temporomandibular joint dysfunction, chronic idiopathic facial pain, and infrequently, migraine with facial pain are examples of idiopathic cases with continuous or prolonged bilateral trigeminal pain if examinations are normal. When paroxysmal short-lasting pain episodes occur, trigeminal autonomic cephalalgias, such as idiopathic stabbing headaches if the pain is primarily in the ophthalmic (V1) trigeminal distribution or short-lasting unilateral neuralgiform headache attacks (SUNHA) if the pain is accompanied by cranial autonomic symptoms, should be taken into consideration.

The maxillary (V2) and mandibular (V3) divisions of the trigeminal nerve are most commonly affected by trigeminal neuralgia pain, however the ophthalmic (V1) division is involved in about 25% of cases(Lambru, 2021).

Attacks of trigeminal neuralgia vary greatly in frequency and duration (Ge *et al.*, 2022). Although 74% of people claim that their discomfort lasts between less than a second and two minutes, a sizable minority describe attacks that last between two and ten minutes. Additionally, a sequence of paroxysms lasting up to an hour might occur in up to 70% of patients on occasion, which can lead to confusion in diagnosis. It is crucial to rule out other neuralgiform illnesses in patients who have attacks that last longer than two minutes but otherwise exhibit a phenotype compatible with trigeminal neuralgia. Even among the same individuals, the frequency of attacks varies greatly, ranging from a few to hundreds each day; roughly 40% of patients report more than ten attacks per day. Short-lasting trigeminal neuralgiform pain problems frequently make it difficult to obtain a solid descriptive history of attack frequency and duration. It might be easier to define a single paroxysm as opposed to a collection of paroxysms if we use pain diagrams (Zakrzewska,2021).

Two-thirds of people with trigeminal neuralgia experience relapses and remissions, while the remaining one-third experience persistent pain. There is a wide range in the frequency and length of the remission periods, ranging from months (37%) to years (63%). A variety of triggers may set off the pain of trigeminal neuralgia, including:

- Shaving
- Touching your face
- Eating
- Drinking
- Brushing your teeth
- Talking
- Putting on makeup
- Encountering a breeze
- Smiling
- Washing your face

Complete pain alleviation with manageable side effects must be the aim of treatment for anyone experiencing this terrible agony. Both the pain and the dread of its recurrence should be gone for the patient. The preferred first line of treatment is medical therapy. Surgical treatment alternatives with high success rates are available when medicinal treatment fails or is constrained by severe adverse effects. A patient's medical comorbidities, willingness to take risks, and, to a lesser extent, age all influence the optimum surgical course of action for that patient(American Medical Association,2017).

According to Cheshire, there are numerous treatments available for trigeminal neuralgia (De Stefano, 2025). Traditional analgesics are inferior to anti-epileptic medications, with carbamazepine being the preferred medication. Other medications that have been shown to be effective include phenytoin, lamotrigine, gabapentin, baclofen, and oxcarbazepine. Many patients, however, may not be able to handle effective dosages or finally develop tachyphylaxis. Microvascular decompression, balloon compression, glycerol rhizotomies or RF thermocoagulation, and subcutaneous alcohol branch blockage are examples of surgical procedures. Another alternative is stereotactic gamma knife radiosurgery. Despite showing early promise for treating trigeminal neuropathic pain,

motor cortex stimulation and transcranial magnetic stimulation appear to be unsuccessful for treating classical trigeminal neuralgia (Lambru,2021)

Stani et al. assessed the therapeutic impact of medication and lidocaine block in treating classical trigeminal neuralgia (CTN) in a pilot trial. Thirteen patients with pharmacotherapy-managed CTN were enrolled and divided into two groups: Group I received no extra treatment, while Group II received supplemental analgesic block. The decrease in the number of pain episodes per a month, as measured at 30 and 90 days, was the main outcome. Secondary end-points included comparisons of depression, general health, and pain measures. The findings from the 30- and 90-day follow-up visits revealed that Group II had a greater decrease in the frequency of pain and a greater improvement in the pain, general health, and depression scale scores. The study's findings, according to the authors, indicated a potential clinical advantage of combining medication with lidocaine block. These initial results must be confirmed in carefully planned research. Regarding steroid injections on peripheral nerves in cases of trigeminal neuralgia, there is no information available. However, steroids may have a role in this approach in this instance. Since the patient was no longer under the clinic's custody, there was a lack of observation in this instance. This approach ought to be used and monitored on other patients(Lambru, 2021).

CONCLUSION

Trigeminal neuralgia is still a thorny problem for patients. Various methods are used to treat this disease. Ultrasound-guided peripheral nerve injection can be used as therapy for patient who refuse other minimally invasive procedures. Further study and research are needed to assess this therapeutic method.

REFERENCE

- American Medical Association. Clinical Policy Bulletin: Trigeminal Neuralgia Treatment. USA: Aetna; 2017:0374
- Dong, B., Xu, R., & Lim, M. (2023). The pathophysiology of trigeminal neuralgia: a molecular review. *Journal of neurosurgery*, 139(5), 1471-1479.
- De Stefano, G. (2025). Pathophysiological mechanisms in trigeminal neuralgia. The Impact of sex, neurovascular compression, and nerve fibre function.
- Ge, X., Wang, L., Pan, L., Ye, H., Zhu, X., Fan, S., ... & Ding, Z. (2022). Amplitude of low-frequency fluctuation after a single-trigger pain in patients with classical trigeminal neuralgia. *The journal of headache and pain*, 23(1), 117.
- Hodaie, M. (2024). A plea for surgical equity in the treatment of trigeminal neuralgia. *Journal of Neurosurgery*, 141(3), 844-848.
- Inggas, Made Agus M., et al. Patofisiologi Molekuler Penyakit: Pendekatan Sistem Biologis. Mafy Media Literasi Indonesia Publisher, 2025, doi:10.1112/kakinaan1148.
- Khawaja, S. N., & Scrivani, S. J. (2023). Trigeminal neuralgia. *Dental Clinics*, 67(1), 99-115.
- Lambru Giorgio, Zakrzewska Joanna, Matharu Manjit. Trigeminal Neuralgia: a Practical Guide. England:Practical Neurology; 2021;21:392-402
- Maikap, D., & Padhan, P. (2022). Trigeminal neuralgia as an initial presentation of systemic autoimmune diseases: a case series. *Mediterranean journal of rheumatology*, 33(3), 333-338.
- Nuswanto, Ari, et al. *Imunologi Dasar: Memahami Sistem Pertahanan Tubuh Manusia*. Penerbit Mafy Media Literasi Indonesia, 2024, doi:10.1112/kakinaan112.

- Turton Mervyn, Malan-Roux Pieter. Trigeminal Neuralgia: Case Report and Literature Review. *Stomatological Disease and Science*; 2019:3:7
- Gunarto, U., Nawangtantrini, G., Hapsari, A. T., Wahyudin, W., & Sutrisna, E. (2025). Meningkatkan Kesehatan Saraf Lansia melalui Edukasi Gangguan Tidur, Neuropati, dan Penerapan Senam Otak di Posyandu Lansia. *Linggamas: Jurnal Pengabdian Masyarakat*, 3(1), 1-14.
- Zakrzewska et al. Faculty of Dental Surgery. Guidelines for The Management of Trigeminal Neuralgia. UK; Royal College of Surgeons of England, 2021.