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Ultrasound Guided Peripheral Nerve Block for Trigeminal Neuralgia: A Case Report

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Abstract. Trigeminal neuralgia (TN), sometimes referred to as tic doloureaux or Fothergill disease, is a facial nerve disorder that is widely recognized as one of the most excruciating human ailments. It is characterized by sudden, severe, and recurrent episodes of facial pain that can significantly impair a patient's quality of life. Oral medications are commonly used as first-line therapy; however, they fail to provide long-term relief in approximately half of patients with trigeminal neuralgia. This condition often leads to repeated clinical visits and the need for alternative therapeutic approaches. A 26-year-old woman presented with complaints of severe, intermittent, and sharp pain localized to her left cheek, consistent with the clinical features of trigeminal neuralgia. Several minimally invasive and surgical treatment options are available for managing this condition, including radiofrequency procedures and microvascular decompression. However, these approaches still carry certain risks and may not be acceptable to all patients. Due to its lower risk profile, ultrasound-guided peripheral nerve block can serve as an effective and safer alternative treatment, particularly for patients who refuse or are not suitable candidates for invasive or surgical interventions.

Keywords: Facial Pain; Peripheral Nerve Block; Trigeminal Neuralgia; Ultrasound-Guided Injection; Young Adult Patient.

1. INTRODUCTION

Trigeminal neuralgia, commonly referred to as tic doloureaux, is regarded as one of the most excruciating physical and mental ailments that a person can experience. The trigeminal nerve, which transmits feeling from your face to your brain, is impacted by this chronic pain disorder. Even slight facial stimulation, like brushing your teeth or applying cosmetics, might cause a sudden, intense pain if you have trigeminal neuralgia (Turton,2019).

At first, the patient may have brief, moderate bouts. However, trigeminal neuralgia can worsen and result in more frequent, prolonged episodes of excruciating pain. Women are more likely than men to get trigeminal neuralgia (American Medical Association,2017).

Attacks of pain from trigeminal neuralgia can be frequent for days, weeks, or months at a time, and in extreme situations, they might happen often throughout the day. For months or years at a time, the pain of trigeminal neuralgia may go into remission, becoming less severe or occasionally going away entirely, before returning with greater intensity. Remission intervals are typically shorter and occasionally turn into a more chronic burning, aching, and excruciating sensation that may or may not be accompanied by sharp attack episodes. This case

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presentation's objectives are to outline a case of classical trigeminal neuralgia and its effective peripheral nerve injection treatment (Zakrzewska, 2021).

2. 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 stoppen 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 trigeminale 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 utrasonography 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.

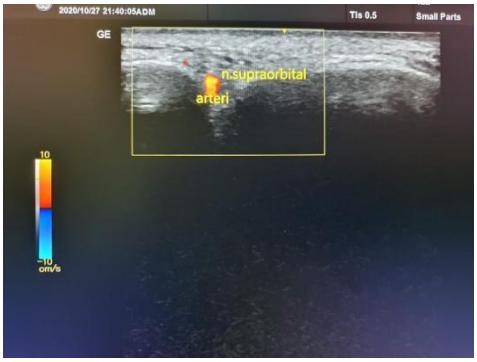

Figure 1. Patient's Ultrasonogram supraorbital nerve before injection.

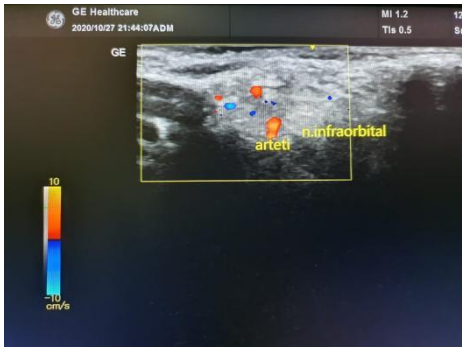

Figure 2. Patient's Ultrasonogram infraorbital nerve before injection.

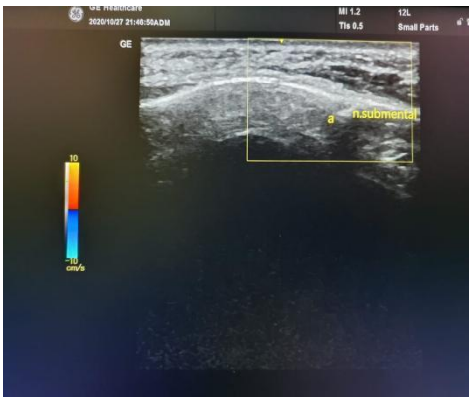

Figure 3. Patient's Ultrasonogram submental nerve before injection.

3. 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. 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).

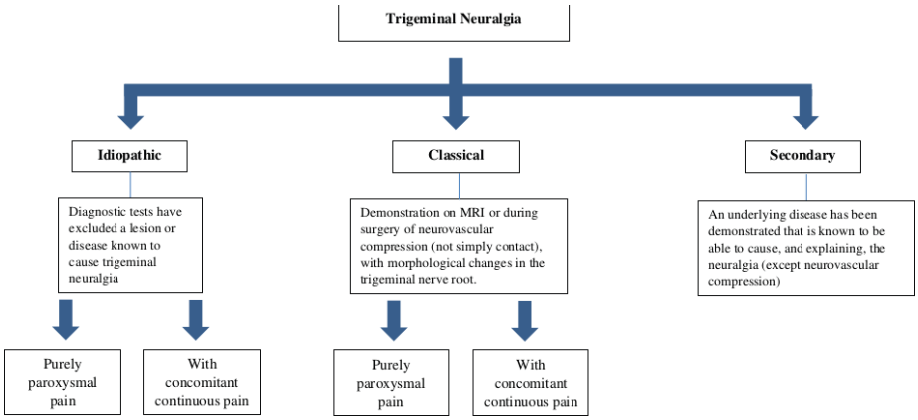

Figure 4. The Classification of Trigeminal Neuralgia.

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. 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:

a. Shaving
b. Touching your face
c. Eating
d. Drinking
e. Brushing your teeth
f. Talking
g. Putting on makeup
h. Encountering a breeze
i. Smiling
j. 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. 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).

4. CONCLUSION

Trigeminal neuralgia is still a thorny problem for patients. Various methods are used to threat 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.

DISCLOSURE STATEMENT

No potential conflict or interest was reported by the authors.

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