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## **Efficacy of Barral Therapy and Maxillary Nerve Gliding with Conventional Therapy in the Management of Classical Trigeminal Neuralgia: A Case Report**

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### **Abstract**

**Introduction:** Trigeminal neuralgia (TN) is a severe, painful condition marked by sudden, electric shock-like cramps and facial pain that lasts from a split second up to 2 minutes. Classification of TN includes classical, secondary, or idiopathic. Classical TN is mainly due to neuro-vascular compression of the trigeminal nerve root by nearby blood vessels. Around two-thirds of patients show a relapsing-remitting course, whereas the remaining one-third experience a continuous, chronic pattern.

**Case presentation:** The patient was a 38-year-old male who presented with complaints of pain on the left side of his face that had persisted for about four years. This pain was characterized by paroxysms (referred to as cramps) above the left first molar tooth after a root canal procedure. Medical treatment included TAB. Esclizen 400 mg and TAB. Trigabantin 100 mg, but the symptoms persisted. After 2 weeks of physiotherapy treatment, and medications were stopped. Diagnostic assessments

included an MRI scan and CT scans. Hypersensitivity and pain were observed in the maxillary (V2) branch.

**Results:** Rehabilitation involved Barral Therapy and Maxillary Nerve Gliding with conventional therapy approaches. Improvement was noted in pain reduction and sensitivity to rehabilitation.

**Discussion:** This case illustrates the importance of a comprehensive approach to managing TN trigeminal nerve glide (Barral therapy) with a conventional therapeutic approach. This case report supports physiotherapy rehabilitation for TN with clear neurovascular compression and highlights the role of rehabilitation as an effective adjunct treatment. Experience reported by the patient emphasizes the potential benefit of the rehabilitation. This approach highlights the necessity for tailored treatment plans in complex TN cases despite challenges in symptom management and treatment adherence.

**Conclusions:** Barral therapy and maxillary nerve glide, along with conventional physiotherapy, can be a good adjuvant treatment for maxillary neuralgia.

**Keywords:** Barral Therapy, Maxillary Nerve Gliding, Conventional Therapy, Classical Trigeminal Neuralgia

### Introduction

Trigeminal neuralgia (TN) is a disorder characterized by sudden, unilateral, short-lasting, stabbing, recurrent pain affecting one or more branches of the trigeminal nerve <sup>1</sup>.

The pain is characterized by electric shock-like cramps described as shooting or stabbing and facial pain that is often triggered by innocuous stimuli and lasts from a fraction of a second to two minutes. TN can be categorized into classical, secondary, or idiopathic forms, with the classical type resulting from vascular compression of the trigeminal nerve root <sup>2</sup>.

Possible causes include demyelination resulting from <sup>3</sup>, infections such as post-herpetic as well as other viral or bacterial conditions, dental problems, facial trauma or injuries, and central sensitization. <sup>2</sup>

Classical TN is defined as a specific category of TN. In this category, magnetic resonance imaging (MRI) with TN Protocol P and contrast reveals neurovascular compression with morphological changes in the trigeminal nerve course. In this case, MRI investigation shows a vascular loop (probably SCA branch) abutting the cisternal segment of bilateral 5th nerves. This is classified as neurovascular conflict grade III.

The prevalence of TN is estimated to range between 0.03% (95% CI 0.01–0.08) to 0.3% (CI 0.16–0.55), with females being affected approximately three times more often than males <sup>4</sup>.

Worldwide, the prevalence of TN is reported to range from 29.5 to 76.8 cases per 100,000 people, equivalent to approximately 0.0295% to 0.0768% <sup>5</sup>.

TN typically exhibits a relapsing–remitting pattern in nearly two-thirds of cases, while about one-third of patients experience a continuous chronic pattern. The timing and duration of the remission periods differ considerably, lasting months in cases (37%) and extending to years in others (63%) <sup>6</sup>.

The pain on the face lasts for variable periods of time, but the patient in this case study is having a chronic type of pain.<sup>4</sup>

The recent pathophysiological hypothesis for classical TN suggests that the pain mechanism is triggered by compression of the trigeminal sensory root by a blood vessel. The root entry zone, the nerve is vulnerable to demyelination because it represents the transition from the Schwann cell myelin sheath to the central myelin generated by oligodendrocytes. Compression by nearby blood vessels can trigger focal demyelination and subsequent remyelination, likely due to microvascular ischaemic damage. These alterations reduce the excitability threshold of affected fibres and facilitate abnormal ephaptic transmission to adjacent fibres. As a result, tactile inputs from fast myelinated (A-β) fibres can stimulate slow nociceptive (A-δ) fibres, resulting in high-frequency paroxysms characteristic of TN.

Medical management includes first-line pharmacological agent carbamazepine (CBZ), gabapentin and pregabalin, Surgical microvascular decompression (MVD), described as separation of the trigeminal nerve from compressing blood vessels, and trigeminal nerve blocks. <sup>11,2</sup>

To develop an acceptable standardized treatment protocol and to see its effect, we performed a manual technique, which is the external manipulation of the infra-orbital bouquet. In this first, an evaluation of pain throughout the trigeminal nerve course was done by the palpation method, then after that, counter-strain towards the

contralateral side was given and thereafter, infra-orbital submaxillary glide was performed. Specific outcome measures used for this study are the visual analogue scale (VAS) and the Brief Pain Inventory BPI-Facial scale (12). The Visual Analogue Scale (VAS) consists of a 10 cm (100 mm) horizontal line with descriptive anchors at each end—for example, 0 indicating “no pain” and 100 indicating “worst possible pain.” Patients are asked to mark a point on the line that best reflects their perceived level of pain.

It is a continuous measure that helps quantify pain intensity. However, since the line represents a continuum, some patients may find it difficult to accurately judge the exact position. Therefore, it can also be adapted into a verbal rating format, where patients rate their pain on a scale from 0 to 10, by demonstrating linear scoring.<sup>12</sup>

Also, 2nd outcome measure used is the Brief Pain Inventory BPI-Facial scale, which describes the pain intensity during specific facial activities. This instrument includes 18 items rated on a 1-point scale (0-10). 4 components measure pain intensity, 7 components deal with the extent to which pain affects daily activities, and the remaining 7 components evaluate the impact of pain on face-specific activities (Table 1, Fig. 1)<sup>12</sup>

The purpose of this study was to explore the efficacy of a manual approach, which is barrel therapy, by using the supra-orbital submaxillary nerve glide. By doing so, this approach helps to establish a better standard of treatment that can serve as a benchmark for comparing the effectiveness of other physiotherapy interventions.

Table 1: Brief Pain Inventory BPI-Facial scale<sup>12</sup>

Factor	Item
Pain intensity	Current pain
	Worst pain in last week
	Least pain in last week
	Average pain in last week
Interference in general activities	General activity
	Mood
	Walking ability
	Normal work
	Relations with other people
	Sleep
	Enjoyment of Life
Interference in face-specific activities	Eating a meal
	Touching one's face
	Brushing or flossing teeth
	Smiling or laughing
	Talking
	Opening one's mouth widely
	Eating hard foods

## Material and Method

### Case Presentation

The patient was a 38-year-old male who, as of 17 March 2026, presented with complaints of pain on the left side of his face that had persisted for about four years. This pain was characterized by the appearance of paroxysms (referred to as cramps) above the left first molar teeth, occasionally leading to difficulty in movement of the mouth, primarily during chewing food, talking for about 5-10 minutes, and during brushing movements.

He first experienced this pain in November 2022 after a root canal procedure for the upper left 1st molar tooth. Before that, for about one and a half months, he felt difficulty in doing the forward bending of the neck. After doing the root canal, the pain was decreased temporarily, but after a week, its intensity increased, and then he was referred to a neurophysician in December 2022. There, an MRI and a CT scan were taken, and the patient was diagnosed with facial and jaw pain suggestive of left 5th nerve neuralgia predominantly affecting the second branch (V2), i.e., maxillary nerve. Along with that, Tab. oxem 450mg 2D was prescribed. He was taking that

tablet for about 4 years, and now oxem 300mg OD is being taken. Medical treatment with TAB.

Esclizen 400 mg and TAB. Trigabantin 100 mg, but treatment was prescribed. As the symptoms continued, after the drug's effect was over, the symptoms still persisted, so, in addition to that, TAB. Etoricoxib (oxem)90 mg and gabapentin-NT medications were also prescribed. And then these symptoms continued to worsen till September 2023, and surgical decompression surgery was recommended.

Investigation results show vascular compression. In May 2022, a CT PNS (plain) was performed. Scans of the paranasal sinuses were obtained with 3mm thick helical slices in coronal planes with axial recon and mild DNS to the right side with hypertrophied left inferior nasal turbinate. In August 2023, an MRI of the brain with CISS imaging, i.e., multiplanar and multiecho MRI of the brain, was done on a 3 Tesla MRI. In that, normal brain imaging with normal appearance of the trigeminal nerves is seen. In May 2024, an MRI of the brain and trigeminal neuralgia protocol P and contrast by multiplanar, multiecho unenhanced MRI of the brain was performed on an MR scanner, using T1-weighted spin echo, T2-weighted turbo spin echo and turbo FLAIR sequences. Additional thin sections through the brain stem and pons were taken for the trigeminal nerve. In that vascular loop (Probably SCA branch), it is abutting the cisternal segment of the bilateral 5<sup>th</sup> nerves which is a neurovascular conflict grade III.

Then he came to our OPD primary assessment of the 5<sup>th</sup> cranial nerve, both sensory and motor components were assessed they didn't show any abnormalities.

During the first session, patients were asked about their pain characteristics. According to the patient, pain does not follow a time pattern, and he rated it 7-8 on a visual

analog scale or evolved up to 8-9. The main type of pain is left maxillary over molar teeth, which rarely radiates into the mandibular region. If irradiated, there is a sensation of an electric shock-like sensation towards the jaw (intra-orbital bouquet region) that lasts for a few seconds up to minutes. He experienced that if he touched the supraorbital and infraorbital area, the pain would improve. After moments of intense pain, he never remained without baseline pain, even if it was mild and lasted for minutes or hours. The patient did not even sleep, leaning on the left side. It only gets aggravated to cold in the morning as a precipitating factor and trigger for pain.

During the physical examination, no skin abnormalities were observed. Sensitivity testing was carried out to evaluate tactile perception and two-point discrimination, along with hypersensitivity of Supratrochlear, supraorbital, and infraorbital nerves. Tactile discrimination was assessed by touching the posterior part of the reflex hammer along the pathway of three branches of the trigeminal nerve. This stimulus may provoke pain is and may indicate the presence of allodynia.

This abnormal, painful response to gentle stroking of the skin is seen in approximately 37% of individuals with secondary TN (1).<sup>8</sup>

Furthermore, the patient tells us that he had difficulty making his beard, also in smiling, especially when talking and brushing his teeth, which causes pain. When tenderness was detected during palpation of the muscles, the diagnostic criteria for temporomandibular disorders<sup>12,13</sup> were used, and the patient was questioned about the presence of pain, if it felt familiar, and if it radiated to other areas. Palpation was performed bilaterally on the temporomandibular joint (TMJ) muscles, including

temporalis, masseter, medial, and lateral pterygoid. A distinct active pain site was noted over the molar tooth. However, TMJ functional movements such as opening, lateralization, and protrusion were found to be normal, and no limitations were observed during neck movements.

**Treatment Protocol**

To begin with the treatment with patients consent, the patient agreed upon the objectives. This case report included the SMART objectives methodology concept <sup>14</sup>.

Table 2: SMART Objectives for physiotherapy treatment

Problem list	Cause	Goals	Physiotherapy Treatment
1. Difficulty in doing facial movements	Increased intraneural pressure	To reduce nociceptive response from moderate to mild while doing movements	Barral therapy with counterstrain (5 repetitions with 10 sec hold and 3 sec rest interval)
2. Pain at maxillary nerve course	Nerve irritation	Reduce pain upto 3 on VAS	Barral therapy with LASER and TENS
3. Pain aggravation due to external stimulus i.e cold	Nerve irritation	To get relief from aggravating factor	Precaution advised: 1. Avoid Cold drinks and washing face with cold water 2. Avoid cold exposure

As of initially, the goal was to lower intraneural pressure and relieve pain; the sessions started with gentle stimuli so that the patient could withstand the tactile stimulus on his face. This was reinforced with a gentle or slight stretch on the maxillary branch by performing contralateral side flexion, i.e., to the right side, so that the patient was aware of the different sensations. A behavioural approach was applied in each session, which included educating the patient with accurate information about the condition and contributing behaviours, as well as clarifying any doubts regarding the process. And pain intensity was noted with the Brief Pain Inventory BPI-Facial scale.

SMART means that the objectives must be specific, measurable, achievable, relevant, and timely. To facilitate the patient’s achievement is divided into 4 weeks of active physiotherapy, as shown in Table 2. It was proposed to reduce intraneural pressure and pain in facial palpation without pain, hygiene, and easy-care activities. To meet the SMART goals within the planned timeframe, the patient was advised that outcomes may differ because of the chronic course of the pathology.

Finally, we examined behavioural changes. The aim of this treatment for TN is to reduce pain by eliminating the patient’s fear of touching their face or receiving any stimulus on it.

To perform this, the first pathway of the maxillary nerve (V2) should be taken into consideration. The palpation of the posterior dental branches should be done manually and is located above the zygomatic process of the maxilla. The infra-orbital technique is performed externally on the face <sup>15</sup>.

Place the patient in the supine position, and stand or sit behind the patient, as shown in Figure 2. Palpate the inferior orbital rim and apply the counter-strain technique

by gently stretching towards the contralateral side, followed by subtle downward (caudad) pressure on the soft tissues. Next, examine the circumference of the orbital foramen to feel for a small ring of connective tissue. Use induction to release the most hardened parts of this ring. Within the infra-orbital foramen, locate a small 2–3 mm nodular structure, and treat it with the same technique. To determine which nerve fibres to treat, do a compression/decompression listening test. As with any foramen, assess the mobility of the fibres as they emerge, ensuring they move freely without restriction. Treat the infra-orbital bouquet with induction<sup>15</sup>. Initially, the movement will be quite sagittal, becoming progressively more oblique until the pain vanishes.



Figure 1: Hand placement during performing the maneuver

The purpose of this study was to explore the efficacy of a manual approach, which is barrel therapy, by using the supra-orbital submaxillary nerve glide. By doing so, this approach helps to set a better standard of treatment, which can then be used as a benchmark to compare the efficacy of barral therapy with physiotherapeutic interventions.

### Discussion

Literature supports the use of the systemic manual therapy (SMT) procedure for TN to ease the pain and clear out the neurovascular compression. Whereas

rehabilitation can serve as an effective adjunct treatment for managing maxillary nerve (V2) neuralgia.

A combination of electrotherapeutic modalities and manual nerve gliding technique is used because of the complex and persistent nature of the patient's symptoms. This case illustrates the importance of barrel therapy: maxillary nerve glide manual therapeutic approach for managing TN cases, highlighting the potential for rehabilitation as an essential treatment. This approach works on the Depression-aspiration and Intraneural release technique. This quietly resembles the viscoelasticity approach, as it also affects meningeal envelopes surrounding the nerve along its passage.<sup>15</sup> This is based on the same principle used to unblock a sink with the flat of a hand i.e palm, pressure is created and then released. Intraneural release maneuver's action goes much deeper. In order to unblock it, stretching and releasing are done. As a result, intraneural pressure diminishes, restoring the distal expansion force and reducing the nociceptive response of the nervinervorum is noted.<sup>15</sup>

Along with that, LASER is used for a duration of 5 minutes, 0.04 joules of energy and mode: pulse with frequency 1Hz. During its application, ATP production in the cell rises as mitochondrial cytochrome C oxidase absorbs the light by decreasing histamine, bradykinin, acetylcholine and prostaglandin E2 and increasing the expression of endorphin mRNA precursor, ATP, and enkephalins<sup>16</sup>.

TENS relieves pain through both peripheral and central mechanisms. Peripherally, it stimulates either large-diameter, low-threshold afferents (A-β) or small-diameter, high-threshold afferents (A-δ), which helps reduce nociceptor activity and diminish unwanted sensory inputs<sup>17,18</sup>. Research at the molecular level

indicates that TENS modulates pain-related ion channels, like voltage-gated sodium channels, thereby inhibiting nociceptive neurotransmission<sup>19</sup>. Centrally, TENS stimulates descending inhibitory pathways involving the periaqueductal gray (PAG), rostral ventromedial medulla (RVM), and spinal cord, which reduces pain transmission in the dorsal horn.<sup>19</sup> Furthermore, high-frequency TENS increases the release of  $\beta$ -endorphins and methionine-enkephalin, which bind to opioid receptors and decrease glutamate and substance P release, potentially reducing central sensitization<sup>20</sup>.

### Conclusion

This study demonstrated that a complicated problem, such as TN, can be effectively treated by focusing on manual therapy, such as Barral therapy with maxillary nerve glide technique, with conventional physiotherapy. It also illustrates that healing can be facilitated by removing the barriers that hinder recovery. The study results support the hypothesis that TN pain can be treated by creating intermittent interruptions in the self-reinforcing loops that sustain it. This is illustrated by the observation that the strategy to address treatment elements using protocols hypothesized to do so, Barral, yields outcomes that are better than the therapeutic modalities.

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