



CASE REPORT

Unusual Presentation of Trigeminal Neuralgia and its Surgical Management

Chandresh Jaiswara,¹ Vyomika Bansal,^{2,*} Apoorva Rai,² Arjun Deepak Mahajan³ and Vedita Singh²

¹Professor, Department of Oral and Maxillofacial Surgery, Faculty of Dental Sciences, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India

²Junior Resident, Department of Oral and Maxillofacial Surgery, Faculty of Dental Sciences, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India

³Fellow, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India

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Abstract

Trigeminal neuralgia (TN) is a debilitating neuropathic condition characterized by excruciating, lancinating pain attacks. The standard first-line treatment of TN is carbamazepine medication, but some patients do not experience relief from this drug. For cases that do not respond to medication, surgical procedures that cut or remove portions of the peripheral nerves, such as the inferior alveolar and mental nerves, can be attempted. However, these neurectomy surgeries often have high rates of severe facial pain recurring over time. A 40-year-old man suffered from chronic, debilitating trigeminal neuralgia. He underwent multiple tooth extractions and took carbamazepine, but neither provided improvement in his agonizing facial pain. He then had surgical neurectomies of the mental and inferior alveolar nerves, which provided only partial pain relief. The patient was not relieved, so he underwent a surgical neurectomy of the lingual nerve. This third procedure successfully provided a significant reduction in his trigeminal neuralgia pain. Lingual neurectomy emerges as a potentially definitive treatment modality for trigeminal neuralgia refractory to medication or alternative neurectomy procedures. This minimally invasive surgical approach offers a valuable option for patients seeking sustained pain relief, particularly those who are not suitable candidates for or desire to avoid, more extensive or resource-intensive interventions.

Keywords: peripheral neurectomy, trigger points, lingual neurectomy, facial pain, trigeminal neuralgia

*Corresponding Author: Vyomika Bansal

Email: bansal.vyomika@gmail.com

Introduction

Trigeminal neuralgia (TN) is a debilitating neuropathic condition characterized by excruciating, lancinating pain attacks. This pain typically affects one or more branches of the trigeminal nerve, the major nerve responsible for facial sensation. As defined by the International Headache Society, TN manifests as "brief jolts of severe pain lasting seconds to a few minutes, recurring along specific areas of the face" [1].

The sudden onset, sharp, and recurrent nature of these attacks significantly disrupts a patient's quality of life. Simple daily activities like washing the face, brushing teeth, or even touching certain areas of the face can trigger an agonizing episode [4]. The mandibular division of the trigeminal nerve is most commonly affected, although the maxillary and ophthalmic branches can also be involved [2,3].

Diagnosing TN often relies solely on the patient's reported symptoms. The excruciating pain can significantly interfere with daily routines, making it challenging to perform routine clinical examinations [4].

While carbamazepine is considered the first-line medication for TN, it doesn't provide adequate pain relief for up to a quarter of patients [5]. For those who don't respond to carbamazepine, other treatment options may be explored. These options include surgical procedures like microvascular decompression, stereotactic radiosurgery, or minimally invasive percutaneous techniques like glycerol rhizotomy or radiofrequency rhizotomy [6].

Peripheral neurectomy is another surgical approach for TN. This minimally invasive procedure has been used for many years to manage intractable cases of trigeminal neuralgia [7]. Notably, neurectomies targeting the inferior alveolar or mental nerve branches have been documented with success in prior studies [8].

However, failure to address potential pain input from the lingual nerve could contribute to high rates of recurrence seen with these procedures [9].

Case Presentation

We present the case of a 40-year-old male with classic trigeminal neuralgia symptoms who underwent multiple tooth extractions and treatment with up to 400mg carbamazepine daily for 6 months without improvement. He subsequently had a mental neurectomy in 2013 and an inferior alveolar neurectomy in 2019, each providing temporary partial relief before his agonizing pain returned. Examination revealed a potential trigger point on the right lateral border of his tongue, suggesting involvement of the lingual nerve distribution. The patient was then planned for surgical lingual neurectomy in an attempt to attain pain control.

The lingual neurectomy was performed under local anesthesia. The incision was made in the mucosa along the anterior tonsillar pillar, just behind the posterior third of the tongue on the affected side. The surgical dissection proceeds by dissecting supraperiosteally and reflecting the mucosa to expose the underlying musculature of the tongue base (Figure 1).

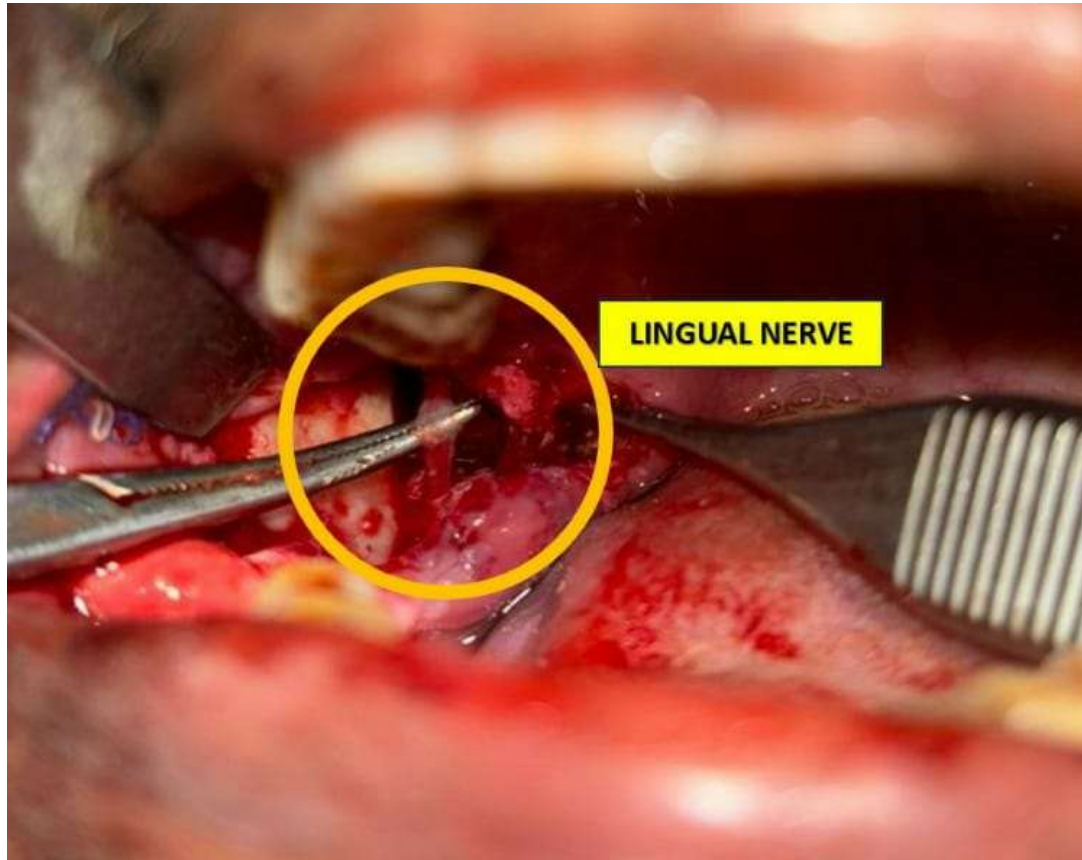


Figure 1. Lingual nerve identified after subperiosteal dissection

The lingual nerve was identified as it courses along the undersurface of the tongue, traveling between the inferior longitudinal muscle and the hyoglossus muscle. Care is taken to isolate the nerve without injuring the surrounding hypoglossal nerve that innervates the tongue muscles. Once the lingual nerve is visualized, a segment of 2-3 cm of the nerve is freed from surrounding tissues using blunt and sharp dissection. (Figure 2) This freed segment was then avulsed (torn away) from its distal and proximal attachments. Hemostasis was achieved by applying electrocautery to the proximal lingual nerve

stump to prevent nerve regrowth and diminish the possibility of painful neuroma formation. The surgical site was then closed in layers using resorbable sutures in the muscle planes and mucosa. Patients were monitored for any bleeding, hematoma, or impaired swallowing function in the immediate post-operative period before being discharged home the same day or after an overnight observation. This neurectomy procedure alleviates trigeminal neuralgia pain by disrupting the sensory innervation from the lingual branch of the trigeminal nerve to the anterior two-thirds of the tongue on the affected side.



Figure 2. Lingual nerve after neurectomy

Discussion

Trigeminal neuralgia (TN) is a neuropathic facial syndrome characterized by sudden, severe, brief, stabbing, and typically unilateral pain in the distribution of one or more branches of the trigeminal nerve. Paroxysmal attacks can last from seconds to minutes and are often triggered by innocuous stimuli like talking, eating, or facial movements [10]. TN demonstrates a slight female predilection and commonly manifests in the fourth decade of life, more frequently affecting the right side and mandibular division.

Diagnosing TN can prove challenging due to symptom overlap with other orofacial pain conditions. A meticulous clinical history and examination remain paramount for accurate diagnosis. While carbamazepine is established as the first-line medical therapy, its long-term use

carries risks of adverse effects. Alternative medications like gabapentin and pregabalin are increasingly employed, either as monotherapy or adjunctive agents [11,12].

Peripheral neurectomy represents a minor, safe, minimally invasive surgical option that can be performed as an outpatient procedure under local anesthesia [13]. It involves surgically dividing or avulsing a peripheral branch of the trigeminal nerve to disrupt the afferent pain pathways. This approach may be favored for patients who cannot undergo more invasive neurosurgical procedures due to financial or medical constraints. Fareedi Mukram Ali, Prasant, et al. performed peripheral neurectomy on 14 patients with terminal branches of trigeminal nerve who were elderly and unfit for surgery. Postoperative pain was relieved after 15 to 24 months of follow-ups. There were no

intra-operative or post-operative complications. None of the patients had post-operative infection. [17] Cerovic et al. [18] in a recent study on peripheral neurectomy of the infraorbital nerve, reports show good post-operative results in the follow-up period between 12 to 15 months. Khanna and Galinde,[19] reported a case of pain relief from peripheral neurectomies, for the infraorbital nerve after 24 months of follow-ups and that for the mental nerve is 26 months follow-up. Quinn [20] reported a case series of 63 patients with 112 neurectomies, in which a follow-up period of 0–9 years was noted, and a pain relief period of 24–32 months was reported.

Surgical intervention is considered for medically refractory cases or when drugs produce intolerable side effects. Peripheral neurectomies offer a treatment option, particularly for select patient populations. However, this approach has limitations compared to other definitive central neurosurgical procedures such as microvascular decompression (MVD) and gamma knife radiosurgery (GKS).

Despite its historical limitations, peripheral neurectomy remains a valuable tool in trigeminal neuralgia treatment. Its advantages include the possibility of outpatient procedures under local anesthesia, making it suitable for elderly, debilitated, or geographically isolated patients who may not be ideal candidates for complex neurosurgery. Furthermore, some patients prefer this approach due to its potentially lower risk profile compared to more extensive surgeries.

Key limitations of peripheral neurectomy include generally lower rates of complete and durable pain relief, paucity of high-quality evidence from large prospective studies, potential for procedural

complications like persistent numbness or dysesthesias, and progressively diminishing efficacy with repeated neurectomies [14,15]. In contrast, central procedures like MVD and GKS that directly address the root causative mechanism of vascular compression demonstrate superior long-term outcomes and safety profiles [16].

For patients who fail to achieve adequate symptom control with medical management, early referral to neurosurgical evaluation may circumvent delays in definitive treatment and avoid risks associated with prolonged medication use or unsuccessful attempts at peripheral neurectomy. Careful patient selection, thorough counseling regarding reasonable expectations, and judicious treatment sequencing are essential when considering peripheral neurectomy within the context of the full therapeutic armamentarium for trigeminal neuralgia.

Conclusions

The success of peripheral neurectomy relies heavily on several factors. Careful selection of patients who are likely to benefit from this surgery is essential. Additionally, thorough discussions with patients regarding realistic outcomes and potential limitations of the procedure are necessary. Finally, strategically sequencing peripheral neurectomy within the broader treatment plan for TN, considering all available options, is paramount.

Conflicts of interest

The authors declares that they do not have conflict of interest.

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