

## Peripheral mental neurectomy followed by obliteration of mental foramen with autogenous bone graft under local Anastasia: An effective and simple technique for trigeminal neuralgia to prolong the remission.

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### Abstract

Trigeminal neuralgia (TN) is characterized by recurrent brief shock, stabbing pain of the oro-facial structures unilaterally. The treatment mainly depends upon patient's condition and severity of the disease. Medical management comes usually first to start. Patient becomes refractive to the medical management with time. Peripheral neurectomy is an alternative, effective and simple method of procedure, in which the avulsion of a peripheral branch of the nerve. It is the simple method that can be performed under local anesthesia, gives excellent pain relief to the patient with minimal risk. But, one problem associated with this is the nerve regeneration, causing the recurrence of neuralgia. To avoid this, here we present a treated case of trigeminal neuralgia by peripheral neurectomy of mental nerve followed by plugging the mental foramen with the autogenous bone graft. It successfully prolonged the pain remission without any complications.

**Keywords:** Trigeminal neuralgia; Foramen; Obliteration; Neurectomy

### 1. Introduction

Trigeminal neuralgia (TN) is otherwise popularly called as Fothergill disease. Clinically it shows characteristic pain which is brief, throbbing, shooting and lancinating type occurs unilaterally in episodes in the orofacial structures developed from one or more main trigeminal nerve (TN) divisions.<sup>1</sup> Commonly involved branches are the maxillary(V2) and mandibular(V3) divisions.

TN is depicted as the most painful condition known to mankind.<sup>2</sup> Pain usually starts by contacting the trigger points including washing the face, shaving, speaking or brushing the teeth and generally it occurs suddenly."Although there is no specific reason for TN, usually it is idiopathic in nature and sometimes the space occupying lesions in the cranial fossa is another important cause. The most accepted concept is a neurovascular origin, where superior or antero-inferior cerebellar artery has an unusual contact with the bundle of trigeminal nerve causing pressure; it further causes destruction of TN leading to demyelination and unusual triggering of neural impulses<sup>1</sup>

To diagnose the TN, there are not any specific verifying diagnostic tests. It is mainly based on the clinician's ability to acknowledge the characteristic signs and symptoms. Commonly for several patients with TN there is no specific cause.  
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Treatment choices include both medical approaches and surgical intercession. Peripheral neurectomy is one of the simple, safest procedures that come under surgical modality. <sup>1</sup> One of the problems associated with peripheral neurectomy is spontaneous peripheral nerve regeneration and thereby causing the recurrence of trigeminal neuralgia

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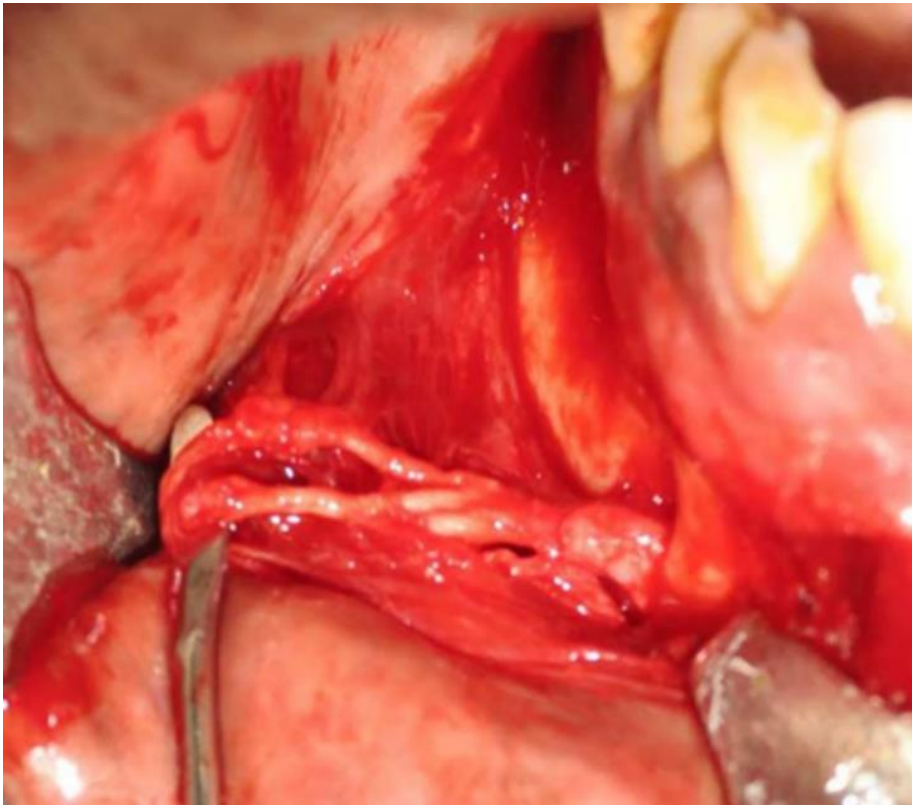
after the surgery within months. Therefore, different types of biocompatible materials (silver and gold foils, amalgam, rubber, sterile wood points, and silicone) have been introduced to put into the foramen where ever nerves avulsed, to prevent the nerve regeneration, preventing the recurrence. Here in this case, we used the autogenous bone graft from the mandibular body on the same surgical side and plugged into the mental foramen and assessed the case.

## 2. Case report

37 years male patient came to the department with repeated occurrence of shock like pain in his right side of face since 5years. The history stated that the pain was severe, started spontaneously in episodes lasting for few hours that increased by chewing, talking, eating food. In the past dental history, he stated that he visited multiple dental clinics for this same reason since 5years and got extracted his right mandibular posterior molars suspecting the pain was originating from those teeth. During the examination, he got shock like stabbing pain (which was noted 9 in the visual analogue scale) on right side of face along the distribution of mental nerve, which regressed spontaneously in 30minutes. On General examination, patient was thin built with all the vitals in normal range and stable. On Extra-oral examination, he has mask like face. Grimace face. (Figure.1) On Intra oral examination, no abnormality detected. Trigger points are present over the right posterior mandibular vestibule and alveolar ridge. Provisional diagnosis was made as trigeminal neuralgia which was confirmed by injecting the local anesthetic agent into mental nerve. The patient got immediate relief from pain for about 1 hour after the mental nerve block. Tab Carbamazepine 100mg twice and Tab Baclofen 10 mg once daily were prescribed initially for 2months, but the patient did not get relief. Then the case was planned for mental nerve neurectomy under local anesthesia. Under strict aseptic conditions, local anesthesia with adrenaline 1:80,000 concentration, right inferior alveolar nerve along with mental nerve block was given. An intra oral incision was given and the flap was raised along the crest to expose the mental nerve (Figure.2) which was freed from its bony canal and adjacent soft tissues. The neurovascular bundle containing the nerve was ligated on either sides and excised. (Figure.3) From the right mandibular body region autogenous bone graft was taken (Figure.4) and plugged into the mental foramen. (Figure.5) Wound was closed surgically after thorough irrigation. (Figure.6) the patient's pain score reduced from 9 on VAS to 2 on VAS postoperatively. Case was followed periodically and the pain score was evaluated up to seven years. Patient was symptom free with relief from pain and lost to follow ups.



Figure 1 Grimace face



**Figure 2** Exposure of Mental nerve



**Figure 3** Mental Neurectomy





**Figure 4** Taking autogenous bone graft



**Figure 5** Obliteration of foramen with bone graft



**Figure 6** Closure of incision

### 3. Discussion

There are two major means to treat TN. one is medical and the other is surgical. Carbamazepine is the first drug of choice in the management of trigeminal neuralgia.<sup>4</sup> Unfortunately, it is not effective in all patients, and even if found effective, its effect may not give long lasting relief. As per One study which was conducted in 146 patients to know about the long-term efficacy of carbamazepine over a period of 16years and reported an initial success in 60% of participants and only 22% of participants were still finding carbamazepine effective by 5 – 16 years and 44% required additional or alternative treatment. When carbamazepine cannot be used, the alternative evidenced- based medical treatments are lamotrigine and baclofen.<sup>4</sup>

When medical treatment fails, surgical options can be considered due to either poor response to drugs or due to their unpleasant side effects.<sup>5</sup> Currently available surgical options are Non-invasive techniques include alcohol injections, cryotherapy, peripheral neurectomy, selective radio frequency thermocoagulation. Invasive technique includes microvascular decompression, Retro gasserianganglion rhizotomy, Radio frequency rhizotomy, Balloon decompression of trigeminal nerve, stereotatic radiosurgery – Gamma knife.<sup>6</sup>

Selecting the accurate surgical procedure to treat TN is based on patient's physical and mental condition. Peripheral surgeries are usually performed in patients not suitable for or not willing to take other procedures. Peripheral neurectomies are invasive neuro-destructive procedures, but have the advantage of being performed under local anesthesia tolerable by most patients.<sup>7</sup> It an outpatient procedure, which is also to be the modest and minimally invasive in nature. <sup>8</sup> But according to one study, 25% of the Indian patients who received peripheral neurectomy, there was recurrence of neuralgia within 6 months after surgery.<sup>9</sup> Quinn and Weil reported finding bony foramina being filled with natural bone during the neurectomies, to prolong the effect. Hence the need to obliterate the foramen with a compatible material was highlighted in this case report.

The purpose of plugging the foramen with autogenous graft was to see whether there was any change in the pain-free period. We are quite satisfied with this patient where neurectomy was done with the placement of bone graft. So, by preventing the nerve regeneration, the chances of recurrence are also reduced.<sup>10</sup> The neurectomies, as described here, are a superior choice to with alcohol/phenol based nerve blocks for TN. The peripheral nerve blocks may lead to adversities namely local toxicity, irritation/inflammation of nerve, fibrotic recation and burning alcohol neuritis.

#### 4. Conclusion

In this case report, an attempt is made to prove that peripheral neurectomy followed by plugging the foramen with autogenous bone graft is a simple surgical procedure with low morbidity and it prolongs the recurrence of Trigeminal neuralgia. Though many treatment procedures have been available, still peripheral neurectomy followed by obliteration of foramen remains the one of the best for the treatment options to prolong the remission of TN in India which has majority of rural population and cannot afford other advanced treatment options for Trigeminal neuralgia.

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#### Compliance with ethical standards

##### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

##### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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