

## Peripheral Neurectomy under Local Anesthesia-Case Report

<sup>1</sup>Vijay Ebenezer, <sup>1</sup>K. Balakrishnan and <sup>2</sup>M. Sivakumar

<sup>1</sup>Department of Oral and Maxillofacial Surgery,  
Sree Balaji Dental College and Hospital, Bharath University, Chennai, India  
<sup>2</sup>Sree Balaji Dental College and Hospital, Bharath University, Chennai, India

**Abstract:** Peripheral neurectomy is a simple and effective method of procedure widely performed throughout the world for the treatment of trigeminal neuralgia. At the acute conditions of pain, we have an case who had underwent an peripheral neurectomy on the affected left side of the face. He had a history of pain particularly in the evening and morning session for the past 6 months and patient reported to the department with a unshaved face on both right and left side of the face. There is a severe lancinating type of pain that occurs on particular triggering points and patient was not affordable. So, neurectomy was planned for the patient and treatment was done under local Anesthesia with adrenaline. Neuralgia is severe pain along the course of a nerve. The pain occurs because of a change in structure or function due to irritation or damage of a nerve. Neurectomy has been reported as a successful treatment by many surgeons for the treatment of trigeminal neuralgia.

**Key words:** Trigeminal Neuralgia • Neurectomy • Local Anesthesia • Herpes Zoster • Triggering Zones

### INTRODUCTION

Trigeminal neuralgia also known as prosopalgia, Serivani *et al.* [1] suicide disease [2] or Fothergill disease [3] is a neuropathic disorder characterized by episodes of intense pain in the face, originating from the trigeminal nerve. It is also known as tic douloureux [4]. It has been described as among the most painful conditions known to mankind [5]. It is estimated that 1 in 15,000 or 20,000 people suffer from Trigeminal neuralgia, although the actual figure may be significantly higher due to frequent misdiagnosis. In a majority of cases, Trigeminal neuralgia symptoms appear more frequently over the age of 50, it is more common in females than males [6]. After all options of conservative management and injection treatment have been failed; various surgical methods are used in order to relieve the patient of excruciating pain. Numerous surgical procedures are advocated for the treatment of trigeminal neuralgia [7]. Neurectomy is also the most effective procedure among the many and it is the procedure of surgically cutting through or removal of a nerve or a section of a nerve. This procedure may be performed, rarely, in cases of chronic pain where other

treatments have failed. Neurectomy may cause some degree of numbness, the aim of this study is to investigate the outcome and success of peripheral neurectomy as a surgical procedure in the treatment of trigeminal neuralgia and to evaluate the results obtained by this procedure and their recurrences in a period of ten years follow up among 48 cases.

### MATERIALS AND METHODS

The cases review a consecutive series of 45 patients who underwent peripheral neurectomy carried out in the maxillofacial unit from June 2003 to Oct 2013 at our institution. The diagnosis was based on a detailed history, clinical examination and control of pain by medications Tab Carbamazepine. All these patients were taking Tab Carbamazepine average 600-800 mg/day for 3-4 years under the guidance of physicians.

Carbamazepine is used alone or in combination with other medications to control certain types of seizures in patients with epilepsy. It is also used to treat trigeminal neuralgia (a condition that causes facial nerve pain). Carbamazepine extended-release capsules are used to

treat episodes of mania (frenzied, abnormally excited or irritated mood) or mixed episodes (symptoms of mania and depression that happen at the same time) in patients with bipolar I disorder (manic-depressive disorder; a disease that causes episodes of depression, episodes of mania and other abnormal moods). Carbamazepine is in a class of medications called anticonvulsants. It works by reducing abnormal electrical activity in the brain. Carbamazepine is also sometimes used to treat mental illnesses, post-traumatic stress disorder, drug and alcohol withdrawal, restless legs syndrome, diabetes insipidus, certain pain syndromes and a disease in children called chorea (16).

Ortho Pantmo Graph (OPG) was taken for every patient to find out any local pathology. The branch of nerve involved was identified according to the site of pain and confirmed with diagnostic block with 2% Lignocaine with adrenaline 1:200,000 on chair side. All patients were investigated pre-operatively with OPG/Computerized Tomography scanning (CT) or Magnetic Resonance Imaging (MRI), which revealed no underlying structural abnormalities. The follow-up period covered by this study ranged from 1 to 3 years. The factors analyzed were the demographic details including history of the patients, affected side of the face branch of nerve involved and procedure used postoperative complications, prognosis and any additional procedure used in cases of recurrences. Patients with persistent pain after conservative treatment and intolerance of carbamazepine therapy the cost of the drug and side effects of the drugs like nausea, drowsiness, fatigue etc. all our patients were from rural and remote areas where facilities to neurosurgical centers are limited. Elderly patients who were unfit for surgical procedures and those patients who were reluctant for major neurosurgical treatments were considered for the study all our patients were from rural and remote areas where facilities to neurosurgical centers are limited. Elderly patients who were unfit for surgical procedures and those patients who were reluctant for major neurosurgical treatments were considered for the study.

**Procedure:** Pre-operative photographs and X-rays were taken and patient is prepared and draped with Betadine solution on the surgical site and local anesthesia lignocaine with adrenaline (1:80,000) was administered, the efficacy profile of lidocaine as a local anesthetic is characterized by a rapid onset of action and intermediate duration of efficacy. Therefore, lidocaine is suitable for infiltration, block and surface anesthesia. Longer-acting

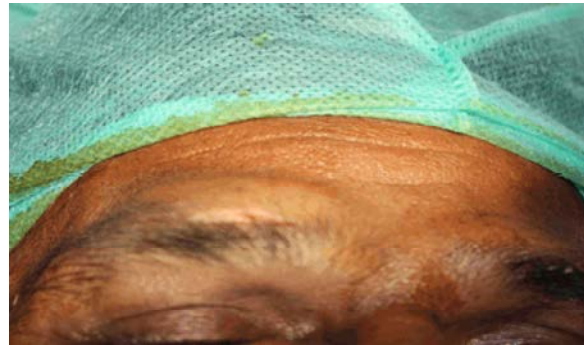


Fig 1: Supra orbital Incision



Fig 2: Exposure of Site



Fig 3: Wound Closure



Fig 4: Vestubular Flap Raised



Fig 5: Exposure of site



Fig 6: Infra orbital nerve Removed



Fig 7: Exposure of site

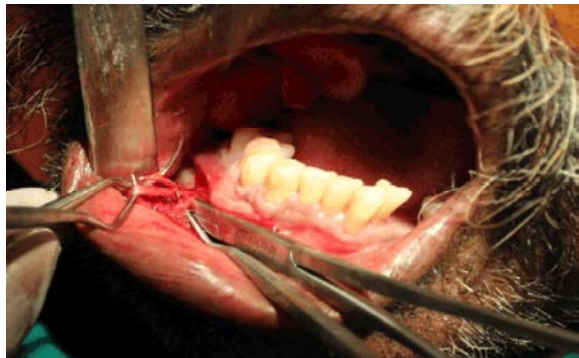


Fig 8: Removal of Nerve



Fig 10: Specimen

substances such as bupivacaine are sometimes given preference for subdural and epidural anesthesia. Lidocaine, on the other hand, has the advantage of a rapid onset of action. Epinephrine vasoconstricts arteries reducing bleeding and also delays the resorption of lidocaine, almost doubling the duration of anaesthesia. For surface anesthesia several formulations are available that can be used e.g. for endoscopies, before intubations etc. Buffering the pH of lidocaine makes local freezing less painful [17].

Extra orally above the supra orbital region followed by infra orbital region and mandibular block was given after the numbness was obtained.

- Supra orbital nerve was approached extra-orally by upper eyebrow incision, the nerve was identified and peripheral neurectomy was performed by avulsing the nerve.
- Access to the infraorbital nerve was through intra oral approach. After taking upper vestibular incision infra orbital foramen was visualized and infra orbital nerve and its peripheral branches were identified and avulsion of the nerve was performed from the soft tissues and from the infra orbital canal by reeling on haemostat.
- Inferior alveolar nerve was approached intra orally by Dr. Ginwalla's incision [3] and the nerve was identified, avulsed from the distal end. Vestibular incision in premolar region was taken; the mental nerve was identified and avulsed from the mental foramen and from the soft tissues. Wound irrigation done with saline, metrogyl mouthwash given. Wound closure done with 3-0 vicryl and 4-0 ethylon. All procedures were performed under Local anesthesia. Antibiotics and anti-inflammatory

was prescribed to the patient post operatively. The patients were followed up post operatively for 3 years Result.

## RESULTS

45 patients underwent neurectomies of which 28 were males and 17 were females whose average age was around 57 years (range 35-71 years). The third division (inferior alveolar) was most commonly affected by the disease, in 20 patients. The second division (infra orbital) was afflicted in 17 patients, second and first division were involved in only 8 patient. The right side was affected in 32 patients, while left side in 13 patients. Both facial sides were not affected in any patient in this series. The mean follow up period was 3 years (range 0-3 years). There were no intra-operative or post-operative complications. None of the patients had postoperative pain, infection, suture dehiscence. All patients were relieved of pain and had discontinued the medications. They were followed up for 3 years. Only 4 patients had recurrence of pain after a period of 1 year, they were prescribed Tab Carbamazepine 200 mg 12 hourly and were relieved of symptoms. Since 4 patients were lost to follow up, the total number evaluated between 0 and 3 years after treatment was 41 patients. Also 4 patients had recurrence of symptoms. Hence procedure is considered to be successful treatment and that are performed all over the world.

## DISCUSSION

The approach to the treatment of trigeminal neuralgia varies greatly, but most authors agree that it should be gradual form of invasive procedure, Currently available surgical options are (1) *Non-invasive technique*: (a) peripheral neurectomy, (b) Alcohol injections, (c) Cryotherapy, (d) Selective radio frequency thermo coagulation (2) *Invasive technique*: (i) Open: micro vascular decompression, (ii) Percutaneous: (a) radiofrequency rhizotomy, (b) Retrogasserian glycerol rhizotomy, (c) Balloon compression of trigeminal nerve, (d) Stereotactic radiosurgery-Gamma knife [8]. Trigeminal nerve is the simplest, safest and minimally invasive surgical method as experienced by the author. In one of our patient there was vascular compression of the nerve root during its intra cranial course which has to be treated by vascular decompression. Due to the high cost, highly invasive craniotomy procedure and increased rate of mortality and morbidity of vascular decompression

procedure, patient preferred the minimally invasive procedure i.e., peripheral neurectomy and is now devoid of symptoms post operatively, is under follow up for last 2 years (9). Most of the studies done for neurectomy were published 20-50 years ago [10, 15]. Quinn (12). Reported a retrospective case series of 63 patients with 112 neurectomies. A follow-up period of 0-9 years was noted and the pain relief period of 24-32 months was reported. Grantham also reported that 55 patients with hemi facial pain was treated with peripheral neurectomies and the follow up period is from 6 months to 8 years (14). Not all patients followed up for 3 years, one was for 2 years only. Surgical access to the infraorbital (V2) and inferior alveolar nerve is intra orally. We consider this access to be better, primarily due to avoidance of post-operative facial scars. Some authors use trans-facial access to the V2 division [11] most probably because of lower risk of the post-operative wound and reduced post-operative edema. No post-operative complications occurred in our patients. The third division (inferior alveolar) was most commonly affected by the disease, in 20 patients (66.66%). The second division (infra orbital) was affected in 9 patients (30%), second and first division were involved in only in one patient.

## CONCLUSION

Peripheral neurectomy is one of the oldest, minimal invasive forms of surgery, well tolerated by the patient those who cannot afford the expenses of the surgery, since this procedure can be electively done to a patient with a systemic diseases and it can be performed under local anesthesia for the people who stays in the rural and domestic areas.

## ACKNOWLEDGEMENT

We are all grateful thanks to our Principal Prof. Dr. Raghavendra Jayesh for providing all facilities for this study.

## REFERENCES

1. Serivani, S., E. Mathews and R. Maciewicz, 2005. Trigeminal neuralgia. Oral Surg Oral Med Oral Pathol Oral Radiol Endod, pp: 527-538.
2. Cerovic, R., 2009. Neurectomy of the trigeminal nerve branches: clinical evaluation of an obsolete treatment. J Cranio-Maxillofac Surg., pp: 388-391.

3. Ginwala, M.S.N., 1961. Surgical treatment of trigeminal neuralgia of third division. *Oral Surg.*, pp: 261-264.
4. Das, B. and S.P. Saha, 2001. Trigeminal neuralgia: current concepts and management. *J Indian Med Assoc*, pp: 704-709.
5. Ong, K.S. and S.B. Keng, 2003. Evaluation of surgical procedures for trigeminal neuralgia. *Anesth Prog.*
6. Liu, J.K. and R.I. Apfelbaum, 2004. Treatment of trigeminal neuralgia. *Neurosurg Clin N Am.*, pp: 181-188.
7. Broggi, G., P. Ferroli, A. Franzini and L. Galosi, 2005. The role of surgery in the treatment of typical and atypical facial pain. *Neurol Sci.*, pp: 95-100.
8. Bagheri, S., F. Farhidvash and V. Perciaccante, 2004. Diagnosis and treatment of patients with trigeminal neuralgia. *J Am Dent Assoc.*, pp: 1713-1717.
9. Chole, R., R. Patil, S. Degwekar and R. Bhowate, 2007. Drug treatment of trigeminal neuralgia: a systemic review of the literature. *J Oral Maxillofacial Surg.*, pp: 40-45.
10. Salama, Hassan, Hesham Ben-Khayal, Mohamed Abdel Salam Mohamed, Ashraf El-Mitwalli, Ashraf Ahmed Zaher, Ashraf EzzEldin, Hatem Badr and Peter Vorkapic, 2009. "Outcome of Medical and Surgical Management in Intractable Idiopathic Trigeminal Neuralgia." *Annals of Indian Academy of Neurology* 12 (3): 173-78. doi:10.4103/0972-2327.56317.
11. Nurmikko, T.J. and P.R. Eldridge, 2001. Trigeminal neuralgia- pathophysiology, diagnosis and current treatment. *Br J Anesth.*, pp: 117-132.
12. Toda, K., 2008. Operative treatment of trigeminal neuralgia: review of current techniques. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, pp: 788-805.
13. Prasad, S. and S. Galetta, 2009. Trigeminal neuralgia: historical notes and current concepts. *Neurologist.*, pp: 87-94.
14. Grantham, E.G. and L.H. Segerberg, 1952. An evaluation of palliative surgical procedures in trigeminal neuralgia. *J Neurosurg.*, pp: 390-394.
15. Khanna, J.N. and J.S. Galinde, 1985. trigeminal neuralgia Report of 140 cases. *Into J Oral Surg.*, pp: 325-332.
16. Cummings, C., M. Stewart, M. Stevenson, J. Morrow and J. Nelson, 2011. "Neurodevelopment of children exposed in utero to lamotrigine, sodium valproate and carbamazepine", pp: 325-332.
17. Cepeda, M.S., A. Tzortzopoulou, M. Thackrey, J. Hudcova, P. Arora Gandhi and R. Schumann, 2010.