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## Research Article

### COMPARISON OF MICRO VASCULAR DECOMPRESSION AND PERIPHERAL NEURECTOMY FOR TRIGEMINAL NEURALGIA: A PROSPECTIVE STUDY

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#### ABSTRACT

Trigeminal neuralgia is a debilitating condition which is characterized by bouts of electric shock-like pain that most commonly involves the second and third division of the trigeminal nerve. This prospective study is done to compare the role of microvascular decompression and peripheral neurectomies for the management of trigeminal neuralgia. Patients were divided in 2 groups from Jan 2010 to Dec 2012. Group I received microvascular decompression and Group II received peripheral neurectomy. Group I patients had a complete pain relief except for minor complications like postoperative CSF leak which was seen in 1 patient. In Group II patients, 2 patients had returned to the department following recurrence of pain after 6<sup>th</sup> and 8<sup>th</sup> month respectively who were planned for microvascular decompression. All patients were followed up for 3 years and no further complaints; micro vascular decompression offers and superior and effective management approach for trigeminal neuralgia when compared to peripheral neurectomy. Selection of the patient is of utmost importance for choosing the appropriate management protocol.

**Keywords:** micro vascular decompression; trigeminal neuralgia; peripheral neurectomy; facial pain; fothergill's disease

#### INTRODUCTION

Trigeminal neuralgia or fothergill's disease is a condition characterized by bouts of electric shock-like sensation that most commonly involves the second or third division and very rarely first division of trigeminal nerve around the oral cavity. It can be a very disabling, debilitating condition and the patients would normally avoid eating, washing, shaving, applying makeup and brushing their teeth, since all these maneuvers may provoke a severe paroxysmal attack of pain<sup>1</sup>. Approximately 80 % of the patients will respond to tegretol and around 60 % to dilantin<sup>2</sup>. Other management modalities available for symptomatic pain relief are retrogasserian rhizotomy, alcohol blocks micro vascular compression-decompression of Gasserian ganglion, trigeminal tractotomy peripheral neurectomy. All these procedures may lead to significant facial neurosensory loss and masseter muscle weakness/atrophy and the most dreaded complication such as anaesthesia dolorosa<sup>1,3</sup>. Posterior fossa micro vascular decompression of the trigeminal nerve is a complicated and sophisticated procedure usually performed by neurosurgeon aimed at treating the central cause of pain, preservation of the involved nerve and leaving no numbness, dysesthesia or corneal anaesthesia behind that normally follows ablative procedures. Surgery is however, reserved for those who either do not tolerate medication or become refractory to such treatment and the pain becomes impossible to control<sup>3-5</sup>. Peripheral neurectomy can be performed on various branches of trigeminal nerve, usually performed by maxillofacial surgeon for managing peripheral pain in trigeminal neuralgia.

Though the procedure is simple there can be high chances of pain recurrence and neuroma formation. In our study we compare the peripheral neurectomy and micro vascular decompression for the management of trigeminal neuralgia.

#### PATIENTS AND METHODS

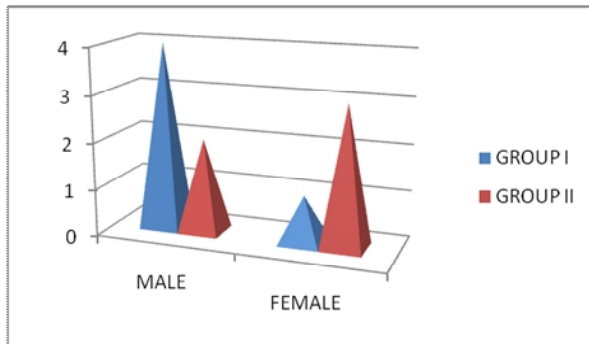
This was a prospective study done in 10 consecutive patients reporting to department of neurosurgery from Jan 2010 to Dec 2012 which were divided in 2 groups. Group I received micro vascular decompression and Group II received peripheral neurectomy. All patients had previously received a trial of tegretol for several years and 4 patients had received alcohol blocks sometime back. Patients were aged between 25 to 58 years with 6 males and 4 females (Graph 1). 7 patients had pain on right side while 3 patients had on left side. Duration of the symptoms was from 2 years to 6 years. 8 patients had pain on mandibular division of trigeminal nerve 2 patients had on maxillary division. All procedures were performed under general endotracheal anaesthesia according to Jannetta's microsurgical description<sup>4</sup>. Micro vascular decompression: Posterior fossa craniectomy was carried out through a retromastoid incision on the appropriate side. The duramater was opened along the sinus, cerebellar lobes were retracted and the trigeminal nerve was visualized using micro-surgical loupes. Vascular compression was found in 5 cases. In all patients, the compression was by a branch of AICA. The compressing vessels were mobilized away from the nerve and maintained in position by a small piece of Gel-foam. Duramater and scalp were closed in layers

(Figure 1). Peripheral neurectomy: Intraoral surgical technique was done for peripheral neurectomies. 3 patients had pain in mental nerve branch while 2 had in inferior alveolar nerve (Figure 2).

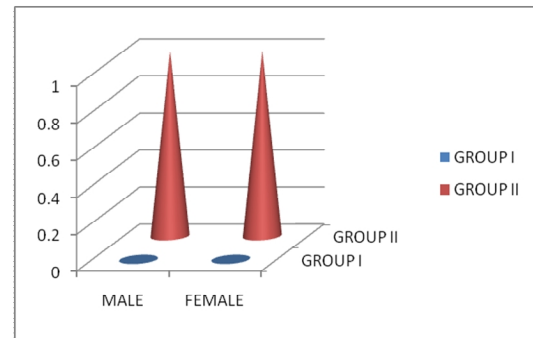
## RESULTS

All patients were followed up for 3 years and no further complaints. There was no postoperative mortality and 9 out of eleven patients had no complications. Group I patients had a complete pain relief except for minor complications like

postoperative CSF leak which was seen in 1 patient. It was controlled by conservative measures with antibiotic administration. In Group II patients, 2 patients had returned to the department following recurrence of pain after 6<sup>th</sup> and 8<sup>th</sup> month respectively who are planned for micro vascular decompression (Graph 2). Thus the results showed that micro vascular decompression is more versatile technique for the management of refractory pain in trigeminal neuralgia when compared to peripheral neurectomy due to high recurrences.



Graph 1: Distribution of patients



Graph 2: Recurrence of Pain

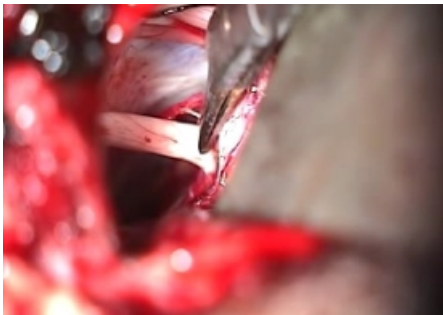


Figure 1: Microvascular decompression of Trigeminal nerve with anterior inferior cerebellar artery



Figure 2: Peripheral neurectomy of mental nerve and its branches

## DISCUSSION

Nicholas Andre was the first person to coin the term “Tic douloureux<sup>5</sup>”. John Fothergill in 1774 presented the description of 14 cases he observed and correlated them trigeminal neuralgia<sup>6</sup>. Walter Dandy in 1934 suggested that a posterior fossa anomaly may be responsible for this problem and identified the major compressing vessel as anterior inferior cerebellar artery<sup>7</sup>. Trigeminal neuralgia is an incapacitating and debilitating condition. The most common central cause is vascular compression of the nerve (trigeminal nerve) root entry zone<sup>1,8</sup>. Trigeminal neuralgia must be differentiated from craniofacial/atypical facial pain. Conservative (medical) treatment consists of drug therapy, such as tegretol, lioresal, baclofen, Dilantin alone or in combinations<sup>3,9,10</sup>. For those who are suffering from refractory to such treatment, other procedures including retrogasserian rhizotomy<sup>11</sup>, compression-decompression of gasserian ganglion<sup>12</sup>, alcohol blocks<sup>13</sup>, peripheral neurectomy<sup>14,15</sup>, trigeminal tractotomy and stereotactic microcompression of gasserian ganglion are alternate methods available. However, complications of these procedures include significant facial numbness and masseter weakness<sup>3,4</sup>. Micro vascular decompression is very effective

and relatively safe procedure for majority of patients with intractable neuralgia that has failed to respond to medical treatment or any other procedures. In our group II case 2 patients reported back with recurrence of pain and are subjected for micro vascular decompression. A vein instead of an artery as a compressing vessel and a minor degree of compression lessen the chances of cure as does a long duration of symptoms and prior surgical treatment<sup>2,8</sup>. Surgical complications can be reduced by minimizing retraction in the cerebello-pontine angle<sup>8</sup> and thereby decreasing the morbidity of the patient.

## CONCLUSION

Trigeminal neuralgia is the most common cause of facial pain. Diagnosis of this condition is very important. Initial therapy may include low dose of drug administration for pain relief. Surgery is indicated when medical management has failed. Micro vascular decompression remains the most versatile technique when compared to others.

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