ORIGINAL ARTICLE

IMMEDIATE PAIN RELIEF BY MICROVASCULAR DECOMPRESSION FOR IDIOPATHIC TRIGEMINAL NEURALGIA

Naeem ul Haq, Mumtaz Ali, Hayat Mohammad Khan, Muhammad Ishaq, Muhammad Ishfaq Khattak

Department of Neurosurgery, Lady Reading Hospital Peshawar-Pakistan

Background: Trigeminal neuralgia is a common entity which is managed by neurosurgeons in day to day practice. Up-till now many treatment options have been adopted for it but micro-vascular decompression is much impressive in terms of pain control and recurrence rate in all of them. The objective of study was known the efficacy of micro vascular decompression for idiopathic trigeminal neuralgia by using muscle patch in terms of immediate pain relief. **Methods:** This descriptive study was carried out in Neurosurgery Department lady reading hospital, Peshawar from January 2010 to December 2012. All patients who underwent micro vascular decompression for idiopathic trigeminal neuralgia were included in the study. Patients were assessed 72 hours after the surgery by borrow neurological institute pain scale (BNIP scale) for pain relief and findings were documented on predesigned *pro forma*. Data was analysed by SPSS-17. **Results**: Total 52 patients were included in this study. Among these 32 (61.53%) were female and 20 (38.46%) were males having age from 22–76 years (mean 49 years). Right side was involved in 36 (69.23%) and left side in 16 (30.76%) patients. Duration of symptoms ranged from 6 months to 16 years (mean 8 years). History of dental extraction and peripheral neurectomy was present in 20 (38%) and 3(5.76%) patients while V3 was most commonly involved branch with 28(57.69%) frequency and combined V2,V3 involvement was 1 (11.53%). Superior cerebellar artery was most common offending vessel in 46 (88.46%) while arachnoid adhesions were in 2 (3.84%) patients. We assessed patient's immediate postoperatively using BNIP pain scale. **Conclusion:** Micro-vascular decompression is most effective mode of treatment for trigeminal neuralgia in terms of immediate pain relief.

Keywords: idiopathic trigeminal neuralgia, micro-vascular decompression

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INTRODUCTION

Trigeminal neuralgia also known as TIC douloureux is a common painful facial syndrome characterized by sharp transient attack of pain affecting the dermatomal distribution of the trigeminal nerve one or both sides.[1,2] The exact nature of the pain or TN source remains unknown, but it is generally accepted that focal demyelination in the root of the trigeminal nerve is involved in its pathogenesis. This demyelination results in the abnormal transmission and processing of impulses of the trigeminal nerve. As mentioned earlier this demyelination can be due to compression from a vascular loop.[3] Trigeminal neuralgia is the most frequently occurring of the cephalic neuralgias in the population over 50 years of age. It is slightly more common in women (5.9 females compared to 3.4 males per 100,000 population) with an age-sex adjusted incidence of 4.7 per 100,000 population. Facial pain can occur in any distribution of Trigeminal nerve namely ophthalmic (V1), maxillary (V2), and mandibular (V3).[4]

The division of the trigeminal nerve most commonly affected is V2, followed by V3 and V1 being the least common.[5,6] Classical or idiopathic TN includes all cases without an established aetiology (most of them) as well as those with potential vascular compression of the trigeminal nerve, whereas symptomatic TN results secondarily to cases such as tumours or multiple sclerosis.[7] The diagnosis is made by clinical history, general physical examination, neurological examination regarding trigeminal neuralgia, excluding Trigeminal neuralgia mimicking disorders and imaging studies as CT Scan and MRI Brain is needed for excluding structural lesions including tumour, infection, AVM, Chiari malformation type-I and other confounding diagnosis like multiple sclerosis and detecting vascular impingement of the affected trigeminal nerves.[8–10]

TN is not controlled by classical analgesics, but the first-line drugs are anticonvulsants (ACs), usually considered adjuvant analgesics in other pathologies but essential for neuropathic pain. Phenytoin in the past, and now carbamazepine (CBZ)[11–13] are first-line drugs in TN, followed by several second-line ACs such as lamotrigine[14,15] oxcarbazepine[16] gabapentin. Surgical procedures include, percutaneous glycerol Rhizotomy, percutaneous radiofrequency Rhizotomy, percutaneous balloon compression Rhizotomy, stereotactic radio-surgery and microvascular decompression.[17,18] In microvascular decompression

compressing vessel at DREZ is removed and muscle patch or prosthesis is interposed between trigeminal nerve and vesse.[19,20]

Rationale of the current study to determine the efficacy of microscopic microvascular decompression for idiopathic trigeminal neuralgia by using muscle patch in terms of immediate relief of pain. This study is important because it will open a gateway for future researchers on this topic by providing the statistics of disease burden and efficacy of this procedure. Furthermore by comparison with the results of both national and international studies it will provide us an idea about the skills and experience of our set up neurosurgeons while operating the cases of trigeminal neuralgia by this technique and this will be a set for the patient betterment and care.

MATERIAL AND METHODS

After taking ethical approval for this study from the hospital ethical committee, "Postgraduate Medical Institute, Institutional Research and Ethics board" this descriptive study was carried out in Neurosurgery Department lady reading hospital, Peshawar from January 2010 to December 2012. All patients of idiopathic trigeminal neuralgia who after failed conservative management in the form of tab carbamazepine and other analgesics underwent microscopic micro vascular decompression by using muscle patch with either gender and having age from 2^{nd} – 8^{th} decades were included in the study. Patients of trigeminal neuralgia due to space occupying lesion at CP angle, multiple sclerosis, iatrogenic or traumatic lesion to trigeminal nerve and those responding to medical treatment or unfit for G.A or surgery were excluded. Patients were assessed post operatively by borrow neurological institute pain scale (BNIP scale[21] (Table-1) for pain relief and findings were documented on predesigned *Pro forma*. Data was analysed by SPSS version 17 and represented in the form of graphs and charts.

All the patients underwent thorough history, detailed clinical examination and relevant investigations like MRI of the brain with and without contrast to detect mass occupying lesion in cerebellopontine angle and demylinating plaques of multiple sclerosis. All the patients who were admitted with trigeminal neuralgia and were planned for microvascular decompression were subjected to pre-operative preparation, like complete blood count (CBC) and viral serology (HbsAg and Anti-HCV Ab) was done. Blood and surgical disposables were arranged accordingly.

An informed consent was taken, explaining the prognosis patients were operated by microscopic microvascular decompression by using muscle patch. Then post operatively patients symptomatic relief of pain was assessed by BNIP after 72 hours. We postoperatively use ketorolac as analgesic and after 48 hours stop analgesics and then assess pain relief after on 3rdpost operative day of the surgery. We stopped carbamazepin postoperatively. Patients in which pain didn't relieve fully after the surgery, carbamazepine and gabapentin were used.

RESULTS

We included total 52 patients in our one year study. Among these 32 (61.53%) were female and 20 (38.46%) were male. Age ranged from 22 years to 76 years (mean 49 years). Right side was involved in 36 (69.23%) and left side in 16 (30.76%) patients. Duration of symptoms ranged from 6 months to 16 years (mean 8 years). There was history of dental extraction in 20 (38%) patients 3 (5.76%) patients had history of peripheral neurectomy. V3 was most commonly involved branch in 28 (57.69%) followed by V2 16 (34.61%) and V1 in 2 (7.69%). Both V2 and V3 were involved in 6 (11.53%) table-2.

Operative findings showed superior cerebellar artery was most common offending vessel in 46 (88.46%), Anterior inferior cerebellor artery in 2 (3.84%), and petrosal vein in 2 (3.84%) patients. In 2 (3.84%) patients there was no compressing vessel, but there were arachnoid adhesions (Table-3). we assessed patients immediate postoperatively (after 72 hours postoperatively), using BNIP pain scale. There was pain score 1 in 47 (90.38%), pain score 2 in 4 (7.69%) and pain score 5 in 1 (1.92%) (Figure-1).

Table-1: Borrow neurological institute pain intensity scoring

Score	Description
1	No pain, no medication
2	Occasional pain, no medication required
3	Some pain adequately controlled by medication
4	Some pain not adequately controlled by medication
5	No pain relief

Table-2: Involvement of different branches of 5^{th} nerve in Trigeminal neuralgia (n=52)

Branch involved of 5^{th} nerve in pain of TGN	No of patients	Percentage of patients
V1	2	7.69
V2	16	34.61
V3	28	57.69
V2,V3	6	11.53

Table-3: Operative findings of microscopic MVD for Trigeminal neuralgia (n=52)

Cause	No of patients	%age
SCA	46	88.46%
AICA	2	3.84%
Petrosal vein	2	3.84%
Arachnoid adhesion	2	3.84%

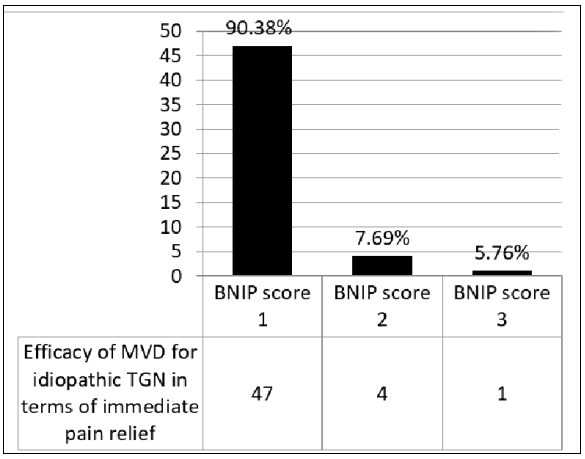

Figure-1: Effectiveness of microscopic MVD for idiopathic Trigeminal neuralgia in terms of immediate post-operative pain control (n=52)

DISCUSSION

The concept of microvascular compression of the trigeminal nerve described by Dandy in 1934[22] rediscovered by Gardner and Miklos[23] and fully recognised and popularised by Jannetta[24] was a milestone in the management of medically intractable trigeminal neuralgia. In the past 30 years thousands of patients have undergone successful microvascular decompression and today it represents one of the most widely used surgical options for trigeminal neuralgia. In our series 32 (61.5%) patients were female with female; male 1.6;1, so the disease was more common in female in our study. V3 was most commonly involved in 28 (53.84%), V2 in 16 (30.76%), and V1 in 2 (3.84%).

Our results are comparable to Giovanni B *et al*[25] who conducted study on 250 cases, and V3 (63%) was most commonly involved similarly kabatas S[26] and colleagues has showed in their study that females are most commonly effected from Trigeminal neuralgia with females; males 1.9;1 in accordance of our study . Operative findings showed superior cerebellar artery was most common compressing vessel, causing compression of trigeminal nerve at DREZ in 46 (88.46%) patients. Which is comparable to that reported by Shams S *et al*[27] in which superior cerebellar artery was responsible for 87%cases Another study conducted by zhang L *et al*[28] in jinan china showed SCA as compressing vessel in 167 (79%) patients. Our results are also comparable to study conducted by Khan *et al*[29] from the same province. They showed that 68% patients were pain free post-operatively and another 26% had significant improvement of symptoms. But, they assessed patients one week after the surgery. In our study we checked the pain at 72 hours and had good improvement in 90% of cases.

Visual Analog Scale (VAS) and the Barrow Neurological Institute Pain Scale (BNI-PS) are two of the most frequently employed patient-reported outcome (PRO) tools used by clinicians to rate pain for patients with trigeminal neuralgia.[30–33] We used BNIP scale to rate immediate relief of pain after MVD. We had pain score 1 in 47 (90.38%) patients. Our results are comparable to zhang L *et al* who had immediate symptomatic relief in 128 (90.1%) patients. Another international study by Giovani B *et al* who reported immediate pain relief in 128 (90.1%) patients. In few other international studies the immediate pain relief after MVD for TGN has been documented as 82–85%.[34,35] This light difference between the results of our study and latter two studies mainly due to the reason that the sample size of these two studies was more as compared to us .We had follow up for a week and this is limitation of our study, because we assessed immediate symptomatic relief after MVD.

CONCLUSION

Microvascular decompression is most effective mode of treatment for trigeminal neuralgia in terms of immediate pain relief as compared to other procedures performed for it.

AUTHOR'S CONTRIBUTION

NH Conceived the study design, supervised the study, write up and proof reading. MA, HMK, MI, MIK did Literature review Data collection, and statistical analysis.

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Address for correspondence:
Dr. Naeem ul Haq, Neurosurgery Unit, Lady Reading Hospital Peshawar-Pakistan
Cell: +92 344 892 8366
Email: naeem_gmc@yahoo.com