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EFFECTIVENESS OF MICRO VASCULAR DECOMPRESSION OF TRIGEMINAL NERVE FOR THE TREATMENT OF TRIGEMINAL NEURALGIA

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ABSTRACT

Objectives: To know the effectiveness of micro vascular decompression of Trigeminal Nerve for Trigeminal Neuralgia.

Material and Methods: This study was conducted in Peshawar Institute of Medical Sciences from January 2010 to July 2014 by the collaboration of Neurosurgery and General Surgery Departments. A total of 106 patients of classical trigeminal neuralgia were treated with microvascular decompression. Eighty cases were resistant to pharmacological treatment while 26 patients opted for micro vascular decompression as first choice. All of them were assessed for relief of pain on 10th, 30th and 180th post-operative day and the results were analyzed.

Results: Mean age of the patients was 50.6 (± 2SD) years with range of 25 to 75 years. Eighty four (79.2%) patients had complete relief of pain while 16 (15%) patients had good relief of pain i-e more than 75% of pain reduction. Four (3.78%) patients had partial relief of pain i-e more than 50% reduction of pain while two (1.8%) patients had poor relief i-e less than 25% of pain reduction.

Conclusion: Microvascular decompression is a standard technique for the treatment of typical trigeminal neuralgia.

Key Words: Trigeminal, Neuralgia, Microvascular, decompression.

INTRODUCTION

Trigeminal Neuralgia (TN) is a syndrome of brief episodes of unilateral lancinating facial pain originating from trigeminal nerve and most of the time the triggering event is not known[1]. Sometime the pain originates after talking, chewing and brushing of teeth. The age of onset of this debilitating condition is usually between 40 to 60 years and predominate the female sex but can occur at any age and of both sexes[2]. The incidence of this pain is 4-5/100,000 and even higher in older population[3]. TN is broadly classified into two major groups. a) Classical or typical or idiopathic TN which included all those cases without a known cause as well as those with vascular compression of trigeminal nerve root entry zone (REZ). b) Symptomatic or atypical TN which includes all those cases occurring secondarily to a tumor in the cerebello-pontine angle or multiple sclerosis[4].

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The treatment of TN is mainly medical however surgical intervention is done in all resistant cases. Micro vascular decompression (MVD) of the trigeminal nerve root is the standard procedure for these resistant cases and is performed all over the world[5]. This treatment is limited by some surgeons to young and fit patients being invasive procedure and less invasive procedures like alcohol blockage, neurectomy, radiofrequency ablation, balloon compression and Gamma knife sectioning are reserved for older and unfit patients[6] while others are of the opinion that every patient, no matter of whatever age should have MVD until there is clear contra-indication for surgery. Not much work is done on MVD in our setup and is grey area for further research. The rationale of this study is to compare our results with that of international data, encourage young surgeons and local guidelines will be made regarding this standard procedure.

MATERIAL AND METHODS

In this study 106 patients of classical trigeminal neuralgia were treated with MVD after January 2010 to July 2014 at Peshawar Institute of Medical Sciences. Eighty cases were resistant to pharmacological treatment while 26 patients opted for MVD as first choice. All the patients underwent thorough clinical investigations

and cardiac assessment in order to rule out co-morbidity and anesthesia fitness. Informed written consent was taken from each patient. All the patients were operated by the same surgeon. Drugs were withheld after surgery in patients who were on pharmacological treatment before surgery. Those with post-operative pain recurrence were started on combination pharmacotherapy in order to deal with the ethical issue. Clinical evaluation of all patients was done on 10th, 30th and 180th post-operative days. The post-operative pain of all patients was classified in to four groups. Complete or excellent relief when 100% reduction in pain, good relief when more than 75% reduction in pain, Partial relief when more than 50% reduction in pain and poor relief when less than 25% reduction in pain. The evaluation of post-operative pain was done by another surgeon who was not the part of operating team.

All the patients of this study were investigated through Magnetic resonance imaging (MRI) before surgery in order to exclude patients of atypical trigeminal neuralgia. Magnetic resonance Angiography (MRA) was done in MRI-negative patients in order to reduce selection bias. All those patients who had no obvious pathology of nerve compression were considered to be having typical Neuralgia.

Craniectomy was done through a standard retro mastoid incision under general anesthesia. Dura was opened and cerebrospinal fluid (CSF) was released gradually. Cerebellum was retracted gently and opening was made in arachnoid matter in order to expose the trigeminal nerve. The nerve was inspected from root entry zone up to the Para petrous area all around. All the vessels in contact with the nerve were separated and a piece of cervical fascia was interposed between the vessels and the nerve root. If the vessel in contact was a vein, it was treated like artery and was dissected as for an artery. Microsoft excell 2007 and SPSS-10 version was used for statistical analysis. Results are presented in form of tables and charts.

RESULTS

Mean age of the patients was 50.6 (±2SD) years with range of 25 to 75 years. Male to female ration is shown in Figure 1. Eighty-four (79.2%) patients had complete relief of pain while 16 (15%) patients had good relief of pain and four (3.78%) patients had partial relief of pain while two (1.8%) had poor relief of pain. Frequency of Trigeminal Nerve involvement with the age of the patients is shown in Table 1. The relief of pain after the surgery is compared with other studies and the results are shown in Table 2.

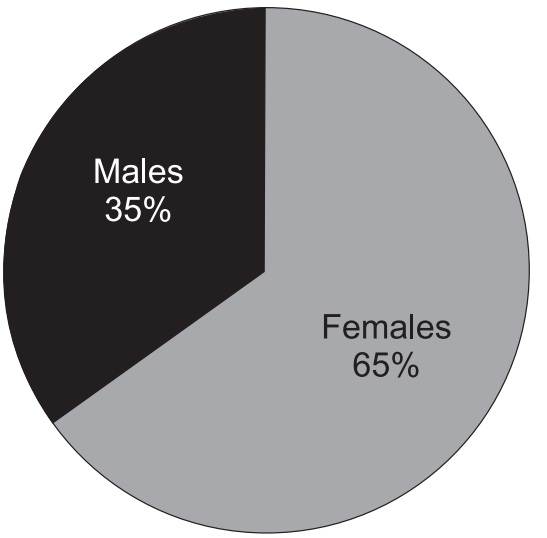

Figure 1: Pie chart showing sex distribution of TN patients (n=106)

Table 1: Frequency of Trigeminal Neuralgia in n=106

Age in years	No. of patients and percentage
25-35	18 (17.0%)
36-45	14 (13.2%)
46-55	22 (20.7%)
56-65	26 (24.5%)
66-75	26 (24.5%)

Table 2: Comparison of pain relief with relevant international studies

International studies	Total No. of patients in each study with %ages of pain relief	Follow up duration
Broggi et al[7] (1998)	141 (74%)	1-6 years
Kondo8 (1997)	281 (87%)	5 years
Zhong et al[9] (2012)	3000 (88.3%)	N/A
Tucer et al[10] (2012)	73 (75.6%)	6 months
Fred et al[11] (1996)	1185 (70%)	20 years
Jagannath et al[12] (2012)	137 (78.8%)	1 year
Current study (2013-14)	106 (79.2%)	6 months

DISCUSSION

Trigeminal Neuralgia is a very painful condition which has no association with the age and sex of the patient. Previously it was thought that it is a disease of older females[13]. In our study 65% of patients were females and patients of all age groups were having this condition but occurred somewhat more in older population. Broggi et al[7] had studied 146 patients of Trigeminal Neuralgia in which 51% were females while Fred et al[11] had reported 60% of females in his study on 1185 patients of Trigeminal Neuralgia. Mean age of patients in this study is 50.6% while Jagganath et al has reported a mean age of 53 years[12]. It is hypothesized that with the growing age the arterioles and venules in the region of trigeminal nerve root become tortious and dilated causing compression on the nerve[14]. As the commonest type of TN is typical or classical neuralgia which commonly occurs due to the compression of nerve root by small vessels or due to chronic adhesion bands between the arachnoid matter and the nerve root causing compression of the nerve at root entry zone so we have included all patients of typical Trigeminal Neuralgia in this study and have excluded the patients of Atypical TN by having Pre-operative MRI scans and then took opinion of expert single radiologist regarding visible compression or contact or other visible pathology. In some other studies the surgeons have treated all the cases whether typical or atypical with the MVD and are of the opinion that most of the patients have benefited from MVD[15].

The percentages of complete pain free patients and of good pain relief in our study were 79.2% and 15% patients respectively which are almost similar to the results of various studies[16]. Out of remaining 6 patients, four patients had partial relief of pain and were those who had chronic neuralgia for more than 10 years and this is one of the bad prognostic factors reported by various studies[17,18]. In these cases the partial relief of pain might be due to the fact that the nerve root was irreversibly damaged. These four cases were put on combination pharmacotherapy of carbamazepine (CBZ) and gabapentin (GBP) as this therapy have acceptable results. In the remaining two patients, who had poor relief of pain, one patient (female) had no compression of nerve root and had zero relief of pain on 10th post-operative day. She was re-explored and the nerve was compressed with bi-polar forceps to reduce the sensitivity and the patient became pain free after surgery. Second male patient had poor relief of pain due to technical reason of shallow posterior fossa and short neck. Exposure of nerve was not satisfactory and was not considered for re-exploration. He was subjected to alcohol blockage and improved with that.

CONCLUSION

Micro vascular decompression is a technique of choice for the treatment of typical Trigeminal Neuralgia and should be performed in all age group patients until there is a clear contraindication.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

Safi MT: Concept and design, drafting the manuscript & final approval of the version to be published.

Iftikhar M: Data collection, analysis and interpretation of results.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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